Vol. 903 Number 2

OFFICIAL GAZETTE

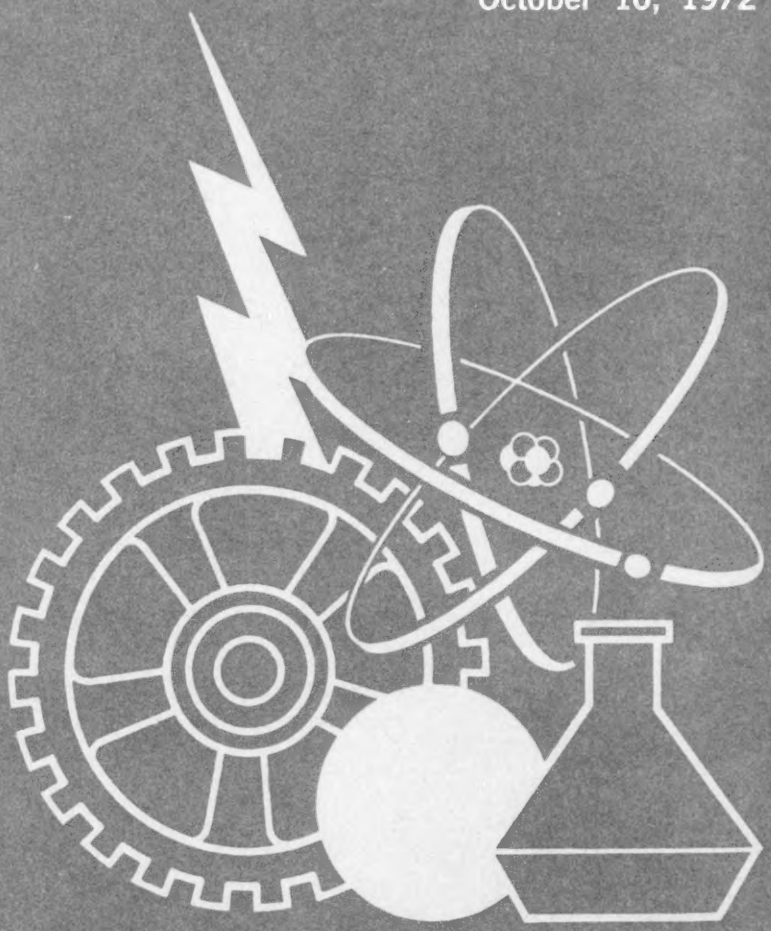
of the
UNITED STATES PATENT OFFICE

SER
BC
& P.

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

October 10, 1972



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

October 10, 1972 Volume 903 Number 2

CONTENTS

Page

Patents and Trademark Notices
- Notice of Daylight Saving Time 368
- Change in Copy Certification Procedures 368
- Registration to Practice 368
- Patent Office Services 368
- Distribution of New Declaration Form PO—1147 (Revised) 368
- United States Adopted Names 368
- Printing of Firm Names on Patents—Request for Comments 369
- Patent Suits 369

Patent Notices
- Certificates of Correction for the Week of October 10, 1972 371

Condition of Patent Applications 372

Defensive Publications 373

Reissue Patents Granted 376

Patents Granted
- General and Mechanical 379
- Chemical 570
- Electrical 650

Design Patents Granted 741

Index of Patentees . . . . . PI 1

Indices of Applicants of Defensive Publications, Reissues and Designs . . . PI 48

Classification of
- Patents (Including Reissues) . . . . . PI 49
- Designs and Defensive Publications . . . . . PI 52

Geographical Index of Residence of Inventors
- Patents (Including Reissues) . . . . . PI 53
- Designs and Applicants of Defensive Publications . . . . . PI 55

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Notice of Daylight Saving Time

Attention is called to the notice published in 897 O.G. 1134, Apr. 25, 1972, as to the operation of the Patent Office on Daylight Saving Time. This operation will terminate on Oct. 29, 1972.

CHANGE IN COPY CERTIFICATION PROCEDURES

Pursuant to 28 USC 1744 the Patent Office provides "copies of letters patent or of any records, books, papers or drawings belonging to the Patent Office and relating to patents, authenticated under the seal of the Patent Office and certified by the Commissioner of Patents, or by another officer of the Patent Office authorized to do so by the Commissioner. . . ." In the interest of improved efficiency the Patent Office will, effective immediately, change its method of certifying copies of the recited materials. Thereafter, the certificate and the copy will be secured together by a staple in lieu of the ribbon currently employed. The new procedures will retain the use of the Patent Office seal and the certification by the Commissioner of Patents or other authorized officer in keeping with the requirements of the above statute.

RICHARD A. WAHL,
Sept. 20, 1972. *Acting Commissioner.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before Nov. 10, 1972.

Barrack, Donald J., 4 Janet Court, East Brunswick, N.J. 08816
Carter, Richard, 8827 64th Ave., #101, Landover Hills, Md. 20784
Helvestine, William A., 1600 S. Eads St., #817N, Arlington, Va. 22202
Kusmer, Toby H., 18 Pickney St., Beacon Hill, Boston, Mass. 02114
Scheel, Walter A., 503 H St. SW., Washington, D.C. 20024
Slobasky, Michael R., 2912 Sycamore St., Alexandria, Va. 22305
Stout, Donald E., 6302 Wingate St., Alexandria, Va. 22312
Trudeau, Raymond, Fetherstonhaugh & Co., 1018 Canada Cement Bldg., Montreal, Quebec, Canada
Wright, William H., 1600 S. Eads St., #408N, Arlington, Va. 22202.

LUTRELLE F. PARKER,
Sept. 12, 1972. *Chairman, Committee on Enrollment.*

Patent Office Services

ADDENDUM TO OFFICIAL GAZETTE NOTICE OF AUG. 8, 1972 (901 O.G. 412)

We wish to call attention to a situation discovered during our study and analysis of the patent copy service. We found that there has been a lack of effective controls affecting orders for printed copies of patents placed by letter, including cash order, and deposit account order forms.

Effective controls for Patent Office coupon orders have been established.

We are now implementing a similar procedure for orders placed by letter, including cash order, and deposit account order forms. It is possible, however, that a few orders submitted in this way in the last few months have gone astray. Accordingly, if you placed such requests for patent copies prior to July 15, 1972, and have not yet received those copies, we suggest that you submit, to the address given below, a follow-up communication which should identify the original request by date and include the Patent Numbers originally ordered.

Address inquiries to:

Director
Office of Public Services
U.S. Patent Office
Washington, D.C. 20231

ROBERT GOTTSCHALK,
Sept. 7, 1972. *Commissioner of Patents.*

DISTRIBUTION OF NEW DECLARATION FORM PO–1147 (REVISED)

In a recent issue of the OFFICIAL GAZETTE (898 O.G. 738) we announced the availability of a new Sole-Joint Declaration Form, PO–1147. The distribution was limited to single copies of the form. We are pleased to report that use of the form has resulted in increased efficiency in processing newly filed applications.

In order to encourage greater use of the form, we now can furnish larger quantities without charge. Accordingly, distribution will be made in single copies or in multiples of 10 forms. Since our supply is limited, only orders for reasonable quantities can be filled.

The forms may be obtained from the receptionist in the lobby of Building 3 at our Arlington, Va. location or by mail request. The latter should be addressed to:

Commissioner of Patents
Washington, D.C. 20231,
Attn: Form Distribution

ROBERT GOTTSCHALK,
Sept. 11, 1972. *Commissioner of Patents.*

United States Adopted Names

List No. 32

March 1, 1972 to June 30, 1972

The following nonproprietary names for the drugs described have been adopted by the USAN Council (the nomenclature committee sponsored by the American Medical Association, the American Pharmaceutical Association and the United States Pharmacopeial Convention) in cooperation with the interested manufacturers. The designation "United States Adopted Name" (USAN) has been coined to distinguish these formally adopted nonproprietary names from other nonproprietary names. Adoption of such names does not imply endorsement of the products involved by the A.M.A. Council on Drugs, the United States Pharmacopeia or the National Formulary.

Any comments or suggestions should be addressed to Doctor Joseph B. Jerome, Secretary, United States Adopted Names Council, American Medical Association, 535 N. Dearborn St., Chicago, Ill. 60610.

amidapsone: prophylactic for Marek's disease
bambermycins: veterinary growth promoting antibiotic
bamoxine: analgesic
benzoyl peroxide: drying and peeling agent
cefadole: antibiotic
clocortolone pivalate: glucocorticoid
dichlorvos: anthelmintic
diflorasone diacetate: topical anti-inflammatory
dipyrithione: anti-bacterial, anti-fungal agent
isoflurane: inhalation anesthetic
ketoprofen: anti-inflammatory
lobendazole: veterinary anthelmintic
lometraline: tranquilizer, anti-parkinson agent
meglumine salicylate: anti-inflammatory, analgesic
naftalofos: veterinary anthelmintic

pepstatin: pepsin inhibitor
salsalate: analgeic, anti-inflammatory
stirofos: veterinary product
tibric acid: hypolipemic
triclosan: bacteriostat
vincofos: anthelmintic
xylazine: analgesic, sedative
zolazepam: CNS depressant

Printing of Firm Names on Patents—Request for Comments

The Patent Office discontinued the recognition of firms of attorneys and agents by rule change, effective July 2, 1971 (890 O.G. 298). Since that time there has been much interest concerning the propriety of printing firm names on the "front page" of patents.

It has been argued that when one is seeking information concerning a patent, it is logical to communicate with the attorney if the inventor cannot be located. The argument continues that it would be more likely for a firm to have continuity of existence and to have retained the file on the case as compared to an individual attorney. While there have been some suggestions that the listing of either a firm or individual attorney on a patent may be unethical and be considered advertising, the general consensus of the patent bar appears to be that such a listing is merely informative and is not objectionable.

The Board of Managers of the American Patent Law Association has urged the Patent Office to revise the transmittal form of the Notice of Allowance and to print on the front page of the patent the name of the firm and/or individual designated on the form returned with the base issue fee.

It is proposed that form POL–85(b) be redesigned to provide for the person submitting the base issue fee to indicate the names and registration numbers of not more than three registered attorneys or agents *or* the name of a firm which includes registered attorneys or agents. An indication would also be required as to whether the name supplied was that of an attorney, agent, or firm. This information would then be used to print the name on the front page of the patent. If no information is supplied, the patent would not include the name of a practitioner or firm, regardless of whether a registered attorney or agent is of record.

Views and comments of the patent community are solicited for consideration in the final determination of the decision and procedure, if appropriate, for printing names of practitioners and firms on the front page of patents. Interested parties should submit their comments in writing prior to Jan. 1, 1973, addressed to the Commissioner of Patents, Washington, D.C. 20231.

ROBERT GOTTSCHALK,
Sept. 8, 1972. *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,669,955, A. Gellman, PLEAT FORMING DEVICE; **3,010,621**, P. J. Bonarrigo, PLEAT-FORMING DEVICES, filed Oct. 18, 1962, D.C., S.D.N.Y., Doc. 62–C–3468, *Abe Gellman & Co. Inc. et ano.* v. *Frank Friedman et al.* Stipulation and order, action discontinued, Mar. 27, 1972.

2,926,420, E. J. Boling, METHOD FOR GAUGING MATERIAL; **3,059,674**, same, APPARATUS FOR GAUGING MATERIAL, filed Oct. 7, 1969, D.C., N.D. Ohio (Toledo), Doc. C–69–308, *Edgar J. Boling* v. *Home Window Company, Inc.* Consent judgment; defendant enjoined from infringing plaintiff's patents, May 1, 1972.

2,938,493. (See 2,999,477.)

2,943,839, R. Birmann, ELASTIC FLUID MECHANISM; **3,032,315**, same, TURBINE BLADING, filed Dec. 22, 1966, D.C. Ariz. (Phoenix), Doc. C–6214–PHX, *De Laval Turbine, Inc.* v. *The Garrett Corporation.* Action dismissed with prejudice as to 3,032,215 and as to all claims except claims 6 and 16 of 2,943,839, Apr. 3, 1972. Stipulation and order dismissing action with prejudice, Apr. 21, 1972.

2,946,069. (See 3,116,556.)

2,999,477, Pratt and Pratt, FIRE ALARM; **2,938,493**, E. C. Pratt, FIRE ALARMS, filed Apr. 14, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–827–DWW, *A-T-O Inc.* v. *Edmund C. Pratt, Ruth C. Pratt, Arleen K. Booth et al.*

3,010,522, H. C. Oppel, BEET HARVESTER; **3,181,616**, same, DIGGING WHEEL FOR SUGAR BEET HARVESTERS; **3,461,967**, N. E. Wells, ROW FINDER FOR ROW CROP HARVESTERS, filed Apr. 7, 1972, D.C. Colo. (Denver), Doc. C–3913, *Opel Harvester, Inc.* v. *HFE, Inc.*

3,010,621. (See 2,669,955.)

3,033,315. (See 2,943,839.)

3,059,674. (See 2,926,420.)

3,116,556, Nyberg and Virta, LAYOUT MACHINE; **2,946,069**, J. D. Bozza, METHOD OF MANUFACTURING MOCCASINS, filed Apr. 21, 1969, D.C., S.D.N.Y., Doc. 69–1651, *Joseph F. Corcoran Shoe Co., Inc.* v. *Frank Noone Shoe Company Inc. and R. H. Macy & Co.* Plaintiff's notice of voluntary dismissal pursuant to Rule 41(a), Mar. 31, 1972.

3,146,290, D. M. Park, ELECTRONIC MUSIC CIRCUIT; **3,383,452**, Park and Campbell, MUSICAL INSTRUMENT; **Re. 26,521**, D. M. Park, AUTOMATIC REPETITIVE RHYTHM INSTRUMENT TIMING CIRCUITRY; **3,255,292**, same, filed Apr. 21, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c961, *The Seeburg Corporation* v. *Sakata International, Inc. et al.* Cause removed from active calendar of Court with leave to reinstate by Sept. 26, 1970, July 31, 1970. Order reinstating cause to active calendar, Oct. 8, 1970. Consent judgment, plaintiff owner of Patents 3,383,452 and Re. 26,521, claims thereof are valid. Plaintiff's complaint and defendants' counterclaims are dismissed without prejudice, Apr. 28, 1972.

3,147,767, J. B. Goss, HYDRAULIC CLEANING APPARATUS; **3,335,962**, R. H. E. Schmidt, BACK-PRESSURE-CONTROLLED-MOTOR-POWERED PUMP, filed Jan. 17, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–71, *American Aero Industries, Inc.* v. *Tritan Corporation.* Voluntary dismissal by plaintiff with order of dismissal thereon; case dismissed without prejudice under Rule 41(a)(1), FRCP, Mar. 21, 1972.

3,181,616. (See 3,010,522.)

3,295,224, K. L. Cappel, MOTION SIMULATOR, filed Oct. 9, 1970, D.C., S.D.N.Y., Doc. 70–C–4427, *Singer-General Precision, Inc.* v. *Research Corporation.* Stipulation and order of dismissal with prejudice, Apr. 17, 1972.

3,330,557, N. O. Young, MEANS FOR FORMING A RIGID LOOP FROM A LIMP LOOP, filed Mar. 29, 1972, D.C., S.D.N.Y., Doc. 72–C–1318, *Loopee International Inc. et al.* v. *Nadel & Sons Toy Corp.*

3,335,962. (See 3,147,767.)

3,350,733, D. C. Hanna, CAR WASHING DEVICES; **3,403,417**, Hanna and Ebeling, CAR ENDS AND SIDES CLEANING BRUSHES; **3,517,405**, same, CAR WASHING FRICTION SCRUBBER, filed Sept. 17, 1970, D.C. Ariz. (Phoenix), Doc. C–70–530–PHX, *Daniel C. Hanna* v. *Hurricane Car Wash Systems, Inc., Jack L. Modrich and Donald E. Follis.* Consent judgment, plaintiff's causes of action against defendants J. L. Modrich and D. E. Follis are dismissed with prejudice. Defendants have infringed certain claims and are permanently enjoined. Counterclaims for declaratory judgment filed by plaintiff dismissed with prejudice, Mar. 20, 1972.

3,353,770, W. Sondheim, UNIVERSAL PUMP BOX APPARATUS, filed May 2, 1972, D.C., N.D. Ga. (Atlanta), Doc. C.A. 16541, *Permco Corporation* v. *Watkins Service Co., Inc. and Watkins-Briant Co.*

3,361,652, Korpiun, Sedlacek, and Steeg, ELECTRODEPOSITION OF BRIGHT TIN, filed July 1, 1969, D.C. Conn. (New Haven), Doc. 13241, *Conversion Chemical Corporation* v. *Lea-Ronal, Inc.* Case dismissed on stipulation of parties, Feb. 9, 1972.

3,363,422, L. A. Turzillo, METHOD AND APPARATUS FOR ANCHORING A TIE-DOWN BAR IN AN EARTH SITUS, filed Apr. 24, 1972, D.C., District of Columbia (Washington), Doc. 792–72, *Lee A. Turzillo, Lee Turzillo Contracting Company* v. *P & Z Mergentime.*

3,365,969, F. Moogk, STEPLESS VARIABLE V-BELT DRIVING GEAR WITH ASYMMETRIC V-BELT, filed Apr. 27, 1972, D.C., S.D. Ohio (Cincinnati), Doc. 8390, *Dayco Corp.* v. *E. & A. Becker KG.*

3,371,383, O. H. Hellsund, CONTINUOUS CASTING APPARATUS; **3,376,371,** Opel and Bottoms, CONTINUOUS CASTING PROCESS, filed Nov. 20, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–2343–F, *Swedlow, Inc.* v. *Rohm & Haas Company.* Order, granting motion to dismiss, Mar. 9, 1970.

3,376,371. (See 3,371,383.)

3,383,452. (See 3,146,290.)

3,388,690, E. Hostetler, POULTRY FEEDER SYSTEM AND PAN ASSEMBLY THEREFOR, filed Apr. 19, 1972, D.C. S.D. Ill. (Springfield), Doc. S–C–72–74, *Chore-Time Equipment, Inc.* v. *Brower Manufacturing Company, Inc.*

3,399,833, A. C. W. Johnson, LOW INTENSITY RADIANT HEATER SYSTEM AND BURNER THEREFOR, filed June 8, 1971, D.C., S.D. Mich. (Detroit), Doc. 36609, *Combustion Research Corp.* v. *Charles L. Green, doing business as G & G Radiant Pro.* Stipulation and order for injunction, Apr. 12, 1972.

3,403,417. (See 3,350,733.)

3,417,926, D. F. De Vorak, SPREADER CHAIN AND FAN DRIVE ASSEMBLY, filed Aug. 12, 1971, D.C., E.D. Ark. (Little Rock), Doc. LR–71–C–150, *Dwight F. De Vorak* v. *Industrial Iron Works, Inc., Elmer Adams and G. W. Purdy.*

3,432,793, Muska, Schacker and McHattie, GROUNDING CONNECTION FOR ELECTRICAL UNIT, filed Feb. 29, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c505, *William A. Muska et al.* v. *Northwest Electrical Supply Co. et al.*

3,458,893, P. Dieffenbach, ARTIFICIAL TREE LIMB TAPERING MACHINE; **3,594,260,** same, ARTIFICIAL SHRUBBERY AND METHOD OF MANUFACTURING THE SAME, filed Apr. 18, 1972, D.C., N.D. Tex. (Fort Worth), Doc. CA–4–1978, *Masterpiece, Inc.* v. *Barrier Corp., Barrier Sales Co. and Abbott Van Backer.*

3,461,967. (See 3,010,522.)

3,480,984, J. V. Kidd, PIG APPARATUS, filed June 9, 1970, D.C., S.D. Tex. (Houston), Doc. 70–H–581, *Kidd Pipeline & Specialties, Inc.* v. *Rubber Applicators and M & J Valve Company.* Stipulation of dismissal, pursuant to Rule 41(a)(1)(ii) FRCP, cause by Kidd Pipeline & Specialties be dismissed with prejudice to any further suit on said patent and that counterclaims filed in such cause by M & J Valve Co. against Kidd Pipeline & Specialties, Inc. be dismissed with prejudice to any further suit based upon or including the claims asserted therein with respect to the acts of Kidd Pipeline & Specialties, Inc. complained of by M & J Valve Co. therein, Apr. 18, 1972.

3,485,312, Swenson and Skime, SNOWMOBILE TREAD DRIVE AND SUSPENSION SYSTEM, filed Dec. 31, 1969, D.C., E.D. Wis. (Milwaukee), Doc. 69–C–637, *Arctic Enterprises, Inc.* v. *Moore Ambulance Service, Inc.* Consent judgment, patent is valid, defendant has infringed. Plaintiff's complaint against defendant Moore Ambulance Service, Inc. dismissed without prejudice, May 4, 1972.

3,517,405. (See 3,350,733.)

3,594,260. (See 3,458,893.)

Re. 26,521. (See 3,146,290.)

Certificates of Correction for the Week of Oct. 10, 1972

D. 223,350	3,606,521	3,623,091	3,656,328
3,301,304	3,606,529	3,623,605	3,656,367
3,522,198	3,607,266	3,624,106	3,657,505
3,540,659	3,607,535	3,625,019	3,657,601
3,545,849	3,607,586	3,625,989	3,658,095
3,556,753	3,607,939	3,626,168	3,658,134
3,557,996	3,608,148	3,632,342	3,658,723
3,560,142	3,608,734	3,633,195	3,658,772
3,560,343	3,608,736	3,633,365	3,658,896
3,573,538	3,608,906	3,633,651	3,658,980
3,574,339	3,609,114	3,634,693	3,660,358
3,576,528	3,609,142	3,634,952	3,660,354
3,576,957	3,609,368	3,636,761	3,660,423
3,579,134	3,609,468	3,636,878	3,661,640
3,579,288	3,609,689	3,637,341	3,662,231
3,582,550	3,610,029	3,637,543	3,663,107
3,583,753	3,610,235	3,637,970	3,663,329
3,584,205	3,611,291	3,639,537	3,663,518
3,585,397	3,611,312	3,642,041	3,663,663
3,586,838	3,612,093	3,642,111	3,663,738
3,587,282	3,612,290	3,644,080	3,664,967
3,588,305	3,613,317	3,645,447	3,665,055
3,591,933	3,613,564	3,645,775	3,665,464
3,593,854	3,615,202	3,645,993	3,665,618
3,593,873	3,615,219	3,647,362	3,665,719
3,594,486	3,615,261	3,647,644	3,666,001
3,595,996	3,615,706	3,649,162	3,666,455
3,596,157	3,615,998	3,649,262	3,666,655
3,596,260	3,616,003	3,649,401	3,666,661
3,596,840	3,616,245	3,650,451	3,667,878
3,598,846	3,616,846	3,650,638	3,668,137
3,599,319	3,617,482	3,651,033	3,668,680
3,599,923	3,617,526	3,651,806	3,669,582
3,601,552	3,617,650	3,652,069	3,669,838
3,601,867	3,617,824	3,652,112	3,669,841
3,602,036	3,617,883	3,653,205	3,669,875
3,602,889	3,618,991	3,653,786	3,669,908
3,604,339	3,620,882	3,653,915	3,670,000
3,604,516	3,621,460	3,654,166	3,670,085
3,604,598	3,621,564	3,654,348	3,670,254
3,604,664	3,621,700	3,654,588	3,671,104
3,604,991	3,622,362	3,654,590	3,671,398
3,605,593	3,622,782	3,655,347	3,671,928
3,606,171	3,622,897	3,655,498	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 19, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-01-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-06-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-15-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	1-26-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-01-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-18-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	3-11-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	6-24-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-18-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-30-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-29-71

Expiration of patents: The patents within the range of numbers indicated below expire during October 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,719,294 to 2,721,998, inclusive
Plant Patents..... Numbers 1,423 to 1,426, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 10, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T930,027
BACTERIA-INHIBITING URETHANE FOAMS

Robert L. McBrayer, Lincoln Park, Mich. (% BASF Wyandotte Corporation, Wyandotte, Mich. 48192)

Continuation-in-part of application Ser. No. 653,672, July 17, 1967. This application Apr. 26, 1971, Ser. No. 137,579

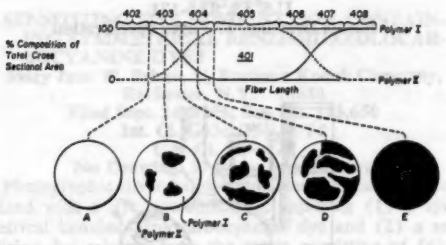
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AI
No Drawing. 11 Pages Specification

The inhibition of the growth of bacteria and fungi in polyurethane foam by the inclusion of the condensation product of 10,10′-oxybisphenoxarsine and epoxidized soy bean oil having a flash point of about 600° F., a specific gravity of about 1 at 20/20° C., and a molecular weight of about 1000 in the polyurethane foam formulation.

T903,028
PROCESS FOR PRODUCING TEXTURIZED YARN

Bobby M. Phillips, 124 Bloomingdale Pike, Kingsport, Tenn. 37662

Filed June 3, 1971, Ser. No. 149,488
Int. Cl. D02g *3/04*
U.S. Cl. 57—140 BY
6 Sheets Drawing. 38 Pages Specification

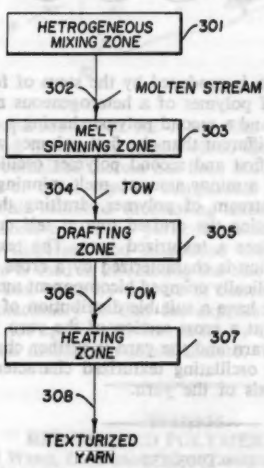


A texturized yarn is produced by forming a molten stream of polymer having a repeating unit of a first length of substantially a first polymer, a second length of a heterogeneous mixture of a major amount of the first polymer and a minor amount of a second polymer having a shrinkage characteristic different than the first polymer, a third length of a heterogeneous mixture of a minor amount of the first polymer and a major amount of the second polymer, a fourth length of substantially the second polymer, a fifth length of a heterogeneous mixture of a minor amount of the first polymer and a major amount of the second polymer, a sixth length of a heterogeneous mixture of a major amount of the first polymer and a minor amount of the second polymer, and a seventh length of substantially the first polymer. After the molten stream of polymer is produced, the process is continued by melt spinning a tow from the molten stream of polymer, drafting the melt spun tow, and heating the drafted tow at self crimping conditions to produce a texturized yarn. The texturized yarn of this invention is characterized by repeating lengths of a cross section of a plurality of helically crimped bicomponent melt spun textile fibers which have a suitable distribution of crimping characteristics at a cross section of the yarn to produce a texturized yarn and the yarn is further characterized by a unit which repeats along the longitudinal axis of the yarn, the unit being composed of a first non-texturized length characterized by a cross section of non-helically crimped substantially monocomponent textile fibers and a second textured length characterized by a cross section of helically crimped bicomponent textile fibers.

T903,029
PROCESS FOR PRODUCING TEXTURIZED YARN

Bobby M. Phillips, 124 Bloomingdale Pike, Kingsport, Tenn. 37662

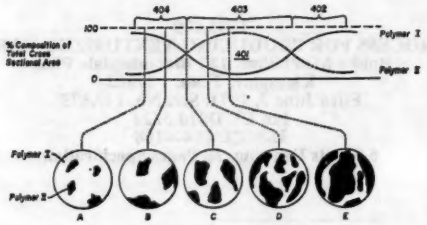
Filed June 3, 1971, Ser. No. 149,575
Int. Cl. D01d *5/22*
U.S. Cl. 264—168
6 Sheets Drawing. 28 Pages Specification



A texturized yarn is produced by the steps of forming a molten stream of polymer of a heterogeneous mixture of a first polymer and a second polymer having a shrinking characteristic different than the first polymer, melt spinning a tow from the molten stream of polymer, drafting the melt spun tow, and heating the drafted tow at self crimping conditions to produce a texturized yarn. The molten stream of polymer is formed by continuously withdrawing a portion of a first polymer from a vertically

confined source of the polymer, continuously withdrawing from a vertically confined source of the polymer a portion of a second polymer having a shrinkage characteristic different than the first polymer, and continuously introducing the withdrawn portions of the first and second polymer into a heterogeneous mixing zone adapted to heterogeneously mix the first and second polymers and discharge a molten stream of a heterogeneous mixture of the first polymer and the second polymer. The texturized yarn of this invention is characterized by a cross section of a plurality of helically crimped bicomponent melt spun textile fibers which have a suitable distribution of crimping characteristics at a cross section of the yarn to produce a texturized yarn and the yarn is further characterized as having a uniform texturized character along the longitudinal axis of the yarn.

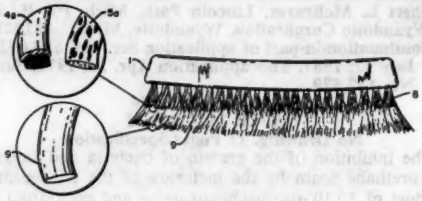
T903,030
PROCESS FOR PRODUCING TEXTURIZED YARN
Bobby M. Phillips, 124 Bloomingdale Pike, Kingsport, Tenn. 37662
Filed June 3, 1971, Ser. No. 149,685
Int. Cl. D02g *3/04*
U.S. Cl. 57—140 BY
6 Sheets Drawing. 40 Pages Specification



A texturized yarn is produced by the steps of forming a molten stream of polymer of a heterogeneous mixture of a first polymer and a second polymer having a shrinking characteristic different than the first polymer wherein the amounts of a first and second polymer oscillate between a major and a minor amount, melt spinning a tow from the molten stream of polymer, drafting the melt spun tow, and heating the drafted tow at self crimping conditions to produce a texturized yarn. The texturized yarn of this invention is characterized by a cross section of a plurality of helically crimped bicomponent melt spun textile fibers which have a suitable distribution of crimping characteristics at a cross section of the yarn to produce a texturized yarn and the yarn is further characterized as having an oscillating texturized character along the longitudinal axis of the yarn.

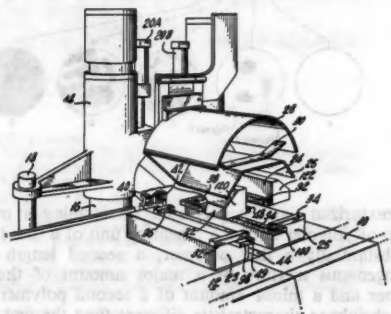
T903,031
WAXING AND POLISHING OF SURFACES BY MEANS OF ABLATIVE WAXING COMPOSITIONS
Lee H. Davis, 4416 Briarwood Road, and Don R. Leonard, 1425 Warpath Drive, both of Kingsport, Tenn. 37662
Filed June 23, 1971, Ser. No. 155,961
Int. Cl. A46b *11/00*; A47l *13/30*
U.S. Cl. 401—96
1 Sheet Drawing. 13 Pages Specification

A bristled waxing and polishing brush, disk, buffing wheel or similar wax applicator in which all or a substantial portion of the bristles of which contain or are constructed of a composition made up of wax intimately mixed, blended or otherwise associated with a polymer matrix such as polyethylene, polypropylene, polyvinyl chloride, polyamides, polyesters, acrylics and other bristle forming polymers or the like, said applicator being specifically designed for deposition of the waxing component or components of the bristles onto a surface such as one composed of wood, metal, leather, plastic or the like followed by polishing to produce on such surface a durable, waterproof or water-resistant coating having any desired degree of polish or sheen. Deposition of the waxing component or components results from ablation or wearing down of the individual bristle structures themselves. After the wax-containing bristles have been substantially worn



down in use by such ablative action, the waxing and polishing element can be discarded and readily replaced by a new unit of the same construction. The composition of which the bristles are composed may contain dyes, pigments, fillers or other desired additives.

T903,032
HOT-KNIFE CUTTER FOR INNER-TUBE SPLICER
Leroy P. Gunner, 764 Belvedere Ave., Westfield, N.J. 07090
Filed Aug. 23, 1971, Ser. No. 173,983
Int. Cl. B26d *7/10*
U.S. Cl. 83—171
3 Sheets Drawing. 17 Pages Specification



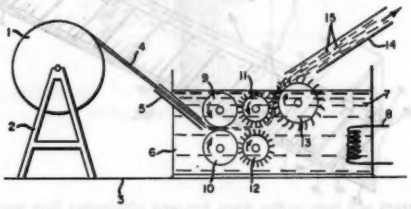
A cutting system for inner-tube butt splicing machines is characterized by a pair of knives in fixed spatial relationship, heated by their resistance to the passage of an electric current through them. The knives, which cut horizontally at a variable speed parallel to the faces of a pair of clamps in coplanar and parallel relationship in which the ends of the unspliced tube are secured, are ground and set to operate within predetermined ranges of rake, bevel, blade relief and cant and are maintained at an appropriate temperature level by coordination of voltage, current and cutting rate.

T903,033
APPARATUS FOR RECOVERING INDIVIDUAL FIBERS FROM A BONDED WEB OR BATT

Donald William Selby, 17 Ravine Road, Wilmington, Del. 19810

Filed Aug. 26, 1971, Ser. No. 175,070
Int. Cl. D01b *1/28;* D21f *1/66*
U.S. Cl. 162—261
1 Sheet Drawing. 11 Pages Specification

Apparatus for recovering individual, inflated, microcellular staple fibers from a group of such fibers which are bonded together with a thermoplastic adhesive as in a bonded web or batt which comprises a shute 5 for feeding bonded batts of the fibers below the surface of a heated liquid contained in an insulated tank 6, a series of combed-brush rollers positioned 11, 12 below the liquid level to contact the batt on opposite sides as the batt



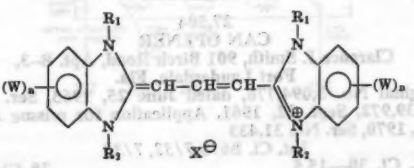
passes between them whereby the fibers of the batt are loosened and separated, and a stripping roll and suction duct for removing the separated fibers from the vessel. The separated fibers may then be reused, along with freshly made inflated, microcellular staple fibers, for making pneumacel fiber batts.

T903,034
SENSITIZING DYE COMBINATION CONTAINING SYMMETRICAL BENZIMIDAZOLOCARBOCYANINE DYES

Mary Jane W. Brizee, % Eastman Kodak Company, Rochester, N.Y. 14650

Filed Sept. 24, 1971, Ser. No. 183,650
Int. Cl. G03c *1/10, 1/14*
U.S. Cl. 96—124
No Drawing. 37 Pages Specification

Photographic silver halide emulsions are spectrally sensitized with a dye combination comprising (1) a symmetrical benzimidazolocarbocyanine dye and (2) a sensitizing dye selected from the group consisting of (a) a hemicyanine dye, (b) a merocyanine dye, (c) a complex cyanine dye containing a 5-membered ketomethylene heterocyclic nucleus containing nitrogen as the first heteroatom and nitrogen or sulfur as the second heteroatom, (d) a dicarbocyanine dye, (e) a tricarbocyanine dye and (f) a hemioxonol dye. In preferred dye combinations the symmetrical benzimidazolocarbocyanine dye has the following formula:

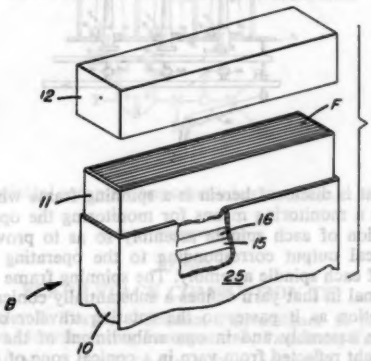


wherein each *n* represents 1 or 2; each R_1 represents an unsubstituted lower alkyl group; each R_2 represents an alkyl group, an alkenyl group or an aryl group; X represents an acid anion and W represents halogen, an alkylcarbamoyl group, an acyl group, an aryl group, an alkyl group, an alkoxy group, cyano, a haloalkyl group or a haloalkylsulfonyl group. Typical highly useful emulsions comprise silver bromoiodide emulsions containing a combination of a symmetrical benzimidazolocarbocyanine dye such as an anhydro-5,5',6,6'-tetrachloro-1,1'-diethyl-3,3' - bis(sulfobutyl)-benzimidazolocarbocyanine hydroxide or 5,5',6,6'-tetrachloro-1,1'-diethyl-3,3'-bis(2-piperidinoethyl)-benzimidazolocarbocyanine iodide and one of the dyes (a) through (f) above.

T903,035
X-RAY FILM BOX HAVING A MONITORING RADIATION SHIELD

Chester W. Opperman, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Sept. 27, 1971, Ser. No. 183,933
Int. Cl. G21f *1/00*
U.S. Cl. 250—108 R
1 Sheet Drawing. 9 Pages Specification



A paperboard box for X-ray film is provided with a radiation monitoring shield which indicates when and if a film contained therein has been accidentally exposed to X-rays or other rays of comparable wave length to X-rays. This radiation monitoring shield consists of a hot melt adhesive having a particulate material impervious to X-rays dispersed and suspended therein. The adhesive mixture is used in assembling the box and can be applied to the box blank by the use of conventional box assembling machinery so that the expense of fabricating this box is not appreciably increased by the addition of this radiation monitoring shield thereto.

T903,036
REINFORCED POLYMERIC FILM

David Wang, Lexington, Mass., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 51,720, July 1, 1970. This application Oct. 12, 1971, Ser. No. 188,579
Int. Cl. C08f *45/08;* C08k *1/08*
U.S. Cl. 260—41 R
No Drawing. 12 Pages Specification

A reinforced thermoplastic polymeric film comprising a thermoplastic polymer, and especially polyvinyl fluoride or polyacrylonitrile, having incorporated therein from 40–100% by weight, based on the weight of the thermoplastic polymer, of inert, reinforcing platelet flake having a length-to-width-to-thickness ratio of at least 5:5:1, the platelet flake preferably consisting of mica, graphite, aluminum silicate pigment or metallic flake aluminum.

REISSUES

OCTOBER 10, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,501

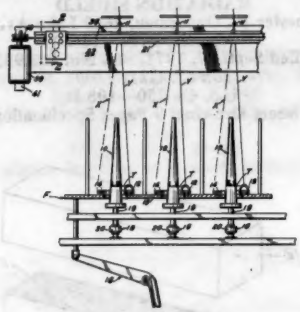
MONITORING DEVICE FOR A SPINNING FRAME

Morris M. Bryan, Jr., Jefferson, and Morris W. Roberts, Atlanta, Ga., assignors to Parks-Cramer Company

Original No. 3,430,426, dated Mar. 4, 1969, Ser. No. 631,790, Apr. 18, 1967. Application for reissue Nov. 30, 1970, Ser. No. 93,923

Int. Cl. D01h *13/16, 13/26, 13/32*

U.S. Cl. 57—34 **14 Claims**



What is disclosed herein is a spinning frame which includes a monitoring means for monitoring the operating condition of each spindle assembly so as to provide an electrical output corresponding to the operating condition of each spindle assembly. The spinning frame is conventional in that yarn defines a substantially conical zone of motion as it passes to the rotating traveler of each spindle assembly and in one embodiment of the invention light reflected from yarn in a conical zone of motion is used to provide the electrical output corresponding to the operating condition of a spindle assembly. In another embodiment of the invention, the operation of a switch means in response to tension of yarn as it passes into a conical zone of motion is used to provide the electrical output corresponding to the operating condition of a spindle assembly. With either embodiment, the electrical outputs may be used to indicate that a spindle assembly is inoperative and may be accumulated by an accumulating means such as a conventional computer to indicate a pattern of operating difficulties indicative of a spindle assembly requiring corrective maintenance.

27,502

SHAKE STRIP ASSEMBLY FOR ROOFING OR SIDING

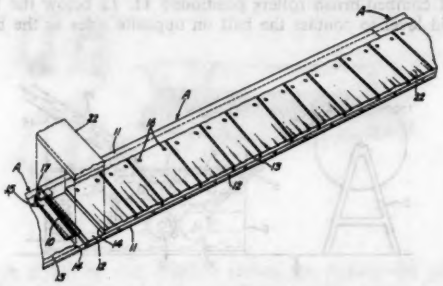
Otis M. Martin, San Jose, Calif., assignor to Ditz-Crane, San Francisco, Calif.

Original No. 3,440,777, dated Apr. 29, 1969, Ser. No. 689,144, Dec. 8, 1967. Application for reissue Dec. 21, 1970, Ser. No. 100,181

Int. Cl. B04d *1/36, 3/362, 13/00*

U.S. Cl. 52—94 **14 Claims**

A roof or side of a building is covered with self-gauging shake strip assemblies which provide their own sheathing. Each shake strip assembly comprises a base strip covered by a membrane with a first course of sawn shingles secured thereto and covered by a second, superposed course of shakes. The upper ends of the shakes are in downwardly spaced relation from the upper edge of the base strip, while their lower ends extend a selected distance below the lower edge of the base strip. The upper ends of the shakes serve as a gauge for positioning the base strip of a next higher shake strip assembly. While not essential, a metal clip or other means may be provided to interconnect and seal the abutting ends of shake strip assemblies of the same row, and to insure against water



leakage therebetween. A preferred means for this purpose is to provide a blank space at each end of the course of shakes on each shake strip assembly, and to close these blank spaces by means of shutter shakes applied after the shake strip assemblies have been attached to a roof or wall.

27,503

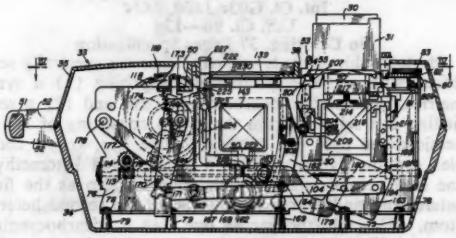
SLIDE PROJECTOR

Irwin M. Gould, Skokie, and Gerald A. Moe, Buffalo Grove, Ill., by Bell and Howell Company, assignee, Chicago, Ill.

Original No. 3,336,836, dated Aug. 22, 1967, Ser. No. 377,232, June 23, 1964. Application for reissue Dec. 27, 1968, Ser. No. 807,467

Int. Cl. G03b *21/00*

U.S. Cl. 353—21 **21 Claims**



A slide projector wherein each slide is successively and automatically previewed before such slide is projected by the projector.

27,504

CAN OPENER

Clarence J. Smith, 901 Birch Road, Apt. B–3, Fort Lauderdale, Fla.

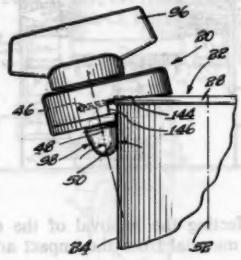
Original No. 3,094,776, dated June 25, 1963, Ser. No. 139,972, Sept. 22, 1961. Application for reissue Apr. 9, 1970, Ser. No. 31,433

Int. Cl. B67b *7/32, 7/38*

U.S. Cl. 30—15.5 **28 Claims**

The structure herein described comprises a can opener for opening the end seam of a metal can by cutting

through the outer wall of the cover hook in a radially inward direction from the outer side of the end seam. The structure comprises a rotary cutter engageable with the outer wall of the end seam and a cooperative back-up roll engageable with the inner wall of the end seam to clamp the end seam therebetween. There is further provided an elongated handle to hold the opener and a rotatable turning knob for positively moving the cutter and



back-up roll relatively toward each other and for traversing the cutter peripherally of the end seam to effect the cutting operation. Guide means engageable with the axial outer edge of the end seam is provided for guiding the cutter at an appropriate dive angle in its traverse movement; and there is further provided a guide roller engageable with the side wall of the can, further to orient and position the cutter in its cutting action.

27,505

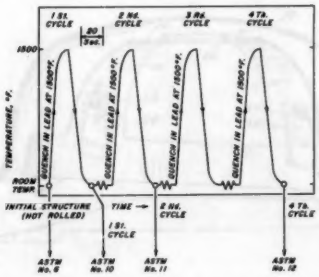
METHOD FOR PRODUCING ULTRAFINE GRAINED STEEL

Raymond A. Grange, Washington Township, Westmoreland County, Pa., and Edward R. Shackelford, Chicago, Ill., by United States Steel Corporation, assignee

Original No. 3,178,324, dated Apr. 13, 1965, Ser. No. 285,121, June 3, 1963. Application for reissue Jan. 14, 1971, Ser. No. 106,598

Int. Cl. C21d *1/18*

U.S. Cl. 148—143 **2 Claims**



A method of producing ultrafine grain size in steel comprising cyclically treating such steel by heating it at least twice to above its Ac_3 temperature but below the temperature at which austenite grains coarsen rapidly for just sufficient time to transform it to an austenitic structure and then before any appreciable grain growth occurs quickly cooling it to transform the austenite in all but the last cycle to a microstructure of the class consisting of martensite, bainite or mixtures and in the last cycle cooling at a rate which will produce the desired microstructure whereby an austenite grain size finer than ASTM #10 is produced therein.

27,506

CERTAIN THIOZOLYLUREA COMPOUNDS

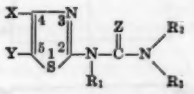
Jean Claude Guillot, Eaubonne, Pierre Poignant, Lyon, and Jacques de Bazelaire de Lesseux, Rueil-Malmaison, France, by Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France, assignee

No Drawing. Original No. 3,551,442, dated Dec. 29, 1970, Ser. No. 540,192, Apr. 5, 1966. Application for reissue May 18, 1971, Ser. No. 144,696

Int. Cl. C07d *91/34*

U.S. Cl. 260—306.8 R **5 Claims**

A thiazole derivative having the general formula



and pesticidal compositions containing the same.

27,507

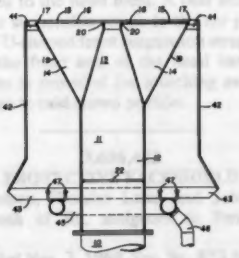
FLARE STACK COMBUSTION TIP

Alexander J. Turpin, Lebanon, Pa., assignor to Smoke-Ban Manufacturing Incorporated, Pasadena, Tex.

Original No. 3,547,567, dated Dec. 15, 1970, Ser. No. 754,135, July 22, 1968. Application for reissue May 13, 1971, Ser. No. 143,672

Int. Cl. F23b *5/00*

U.S. Cl. 431—202 **13 Claims**



A flare stack combustion tip having a centrally disposed gas conduit having an opening in the lower end thereof for communication with a flare stack and the upper end thereof being at least partially closed, a plurality of spaced apart gas conducting channels extending outward from said gas conduit and in open communication along one end thereof with said gas conduit, and a gas emission orifice in an upper segment of each of said gas conducting

channels and extending substantially the entire length of said upper segment, said gas emission orifices being disposed radially with respect to the axis of said gas conduit.

27,508

MACHINE FOR DISASSEMBLING COMPONENTS FROM COMPOSITE PRODUCTS

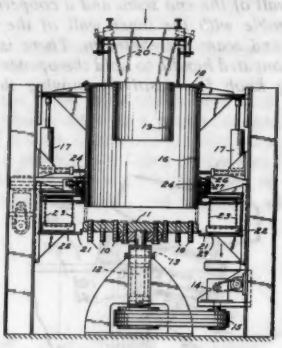
Earl A. Oster and Thomas H. Oster, Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Original No. 3,561,072, dated Feb. 9, 1971, Ser. No. 787,646, Dec. 30, 1968. Application for reissue Feb. 17, 1971, Ser. No. 116,058

Int. Cl. B02c *13/00*

U.S. Cl. 241—186 R **5 Claims**

This invention is concerned wtih a fragmentizing machine for the disintegration of solids and more particularly metallic objects. This fragmentization or disintegration permits the ready disassembling of components from composite products. The disintegration of these metallic objects is accomplished by accelerations imparted to the metallic objects by repeated collisions with rapidly moving blunt impact means driven by and secured to a rotating plate. This invention is especially concerned with



apparatus for effecting the removal of the disintegrated or fragmentized material from the impact area.

PATENTS

GRANTED OCTOBER 10, 1972

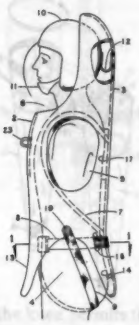
GENERAL AND MECHANICAL

3,696,439

PERSONAL ARMOR

Roger Owen Durham, 3958 Marathon Street, Los Angeles, Calif.

Filed April 1, 1971, Ser. No. 130,075
Int. Cl. F41h *1/04*
U.S. Cl. 2—2.5 **12 Claims**



Personal armor for an individual wearing a safety helmet having a chin strap comprising:

1. A substantially rigid, molded, torso-enclosing body portion, with openings for the hips, arms and head, secured to the wearer by leg, pelvic, and shoulder straps, and with cushions secured to the body portion at the hips and back of the wearer, the body portion having a front and rear skirt to protect the lower portion of the wearer's torso.

2. A hood portion extending upward at the back and sides of the body portion and partially covering the wearer's head.

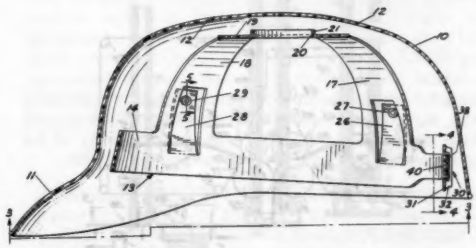
3. A head-restraint strap extending from the hood portion to the back of the wearer's safety helmet.

3,696,440

BASEBALL HELMET

Arnold B. Littleton, Orchard Lake, Mich., assignor to Gay Toys, Inc., Walled Lake, Mich.

Filed March 11, 1971, Ser. No. 123,217
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 A **3 Claims**



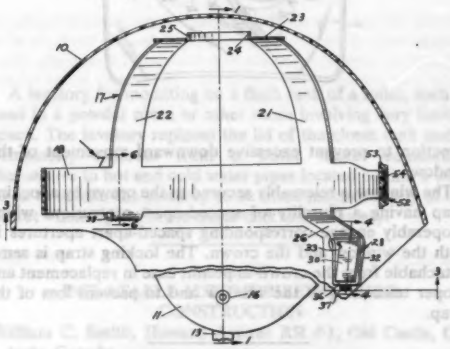
A liner for a child's baseball helmet, and the like, and which includes a crown portion. The liner includes a flexible annular head band having a head size adjustment means, and a plurality of head straps integrally attached at their lower ends to the annular head band at circumferentially spaced apart positions, and with the upper ends of the straps being integrally attached to a head engaging pad. The annular head band, plurality of head straps and head engaging pad being integrally formed from a pliable, flexible plastic material so that the head band and the head straps will conform to the head shape of a user.

3,696,441

RACING HELMET

Arnold B. Littleton, Orchard Lake, Mich., assignor to Gay Toys, Inc., Walled Lake, Mich.

Filed March 11, 1971, Ser. No. 123,219
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 A **4 Claims**



A liner for a child's racing helmet, and the like, and wherein the helmet is a one-piece, molded plastic composition having a crown portion with integral ear protector side extensions. The liner includes an annular head band having a head size adjustment means, and a plurality of head straps integrally attached to the head band at circumferentially spaced apart positions, and with the head straps being integrally attached to a head engaging pad. The head band, head straps and the head engaging pad are integrally formed from a pliable, flexible material so that the head band and the head straps will conform to the head shape of a user. A pair of rear suspension straps are integrally attached to the head band. A rear attachment means secures the rear suspension straps to the ear protector extensions. A pair of U-shaped front suspension straps are integrally connected to the front end of the head band. A front attachment means is provided for attaching each of the front suspension straps to said crown portion.

3,696,442

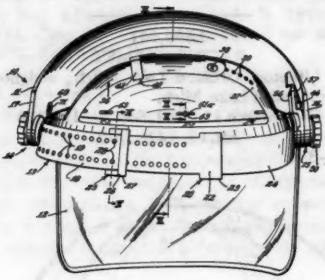
PROTECTIVE FACESHIELD

Paul D. Amundsen, Wonder Lake, and John N. Liautaud, Glenview, both of Ill., assignors to Fendall Company, Chicago, Ill.

Filed Nov. 3, 1969, Ser. No. 873,242
Int. Cl. A42b *1/00, 1/22*
U.S. Cl. 2—8 **11 Claims**

A protective faceshield is provided with head gear in which the head band may be positively adjusted to the proper size by an operator grasping and squeezing the head band with the fingers of one hand. One head band member is provided with a plurality of cam members which cooperate with the holes to provide a unidirectional slip adjustment in one direction and a positive locking in the opposite direction. The head band includes at the ends thereof apertured bosses for receiving cor-

responding studs of the head gear in a tight press fit to permit the head band to be popped from the head gear to facilitate ready replacement in the field. The head gear is pivotally attached to the crown, which pivotal attachment includes apparatus for providing a plurality of stop locations of the crown relative the head gear and which includes an overriding bevel or cam pin to permit the adjusting elements to slide past the stop in one direction and be positively stopped in the other



direction to prevent excessive downward movement of the window.

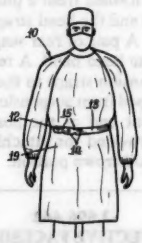
The window is releasably secured to the crown by a locking strap having a plurality of spaced-apart protrusions which cooperably engage corresponding spaced-apart apertures in both the window and the crown. The locking strap is semi-detachable from the crown to permit ease in replacement and proper tensioning of the window and to prevent loss of the strap.

3,696,443

SMOCK OR GOWN WITH ADJUSTABLE BELT

Glenn N. Taylor, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Nov. 16, 1970, Ser. No. 89,965
Int. Cl. A41b 9/00
U.S. Cl. 2—114 **12 Claims**



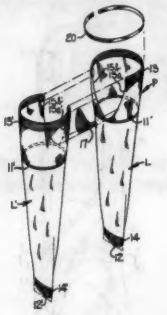
A gown or smock with an opening extending the length of the garment with an attached adjustable belt partially encircling the waist. The adjustable feature is a series of simple female elements in the belt which individually or severally may engage an outwardly projecting rigid male element to hold marginal portions of the opening in overlapping relationship, closing the opening. A particular embodiment is a rear-opening hospital gown with the male element attached to the gown front. When taken from its sterile packaging the belt is wound in a direction to hold the gown open when the fastening elements are engaged, but when worn the direction of winding is reversed with the belt holding the garment closed when the fastening elements are engaged.

3,696,444

PANTY HOSE

Clyde A. Berry, Valdese, N.C., assignor to Pilot Research Corporation, Valdese, N.C.

Continuation-in-part of Ser. No. 531,248, March 2, 1966, Pat. No. 3,310,966, and a continuation-in-part of Ser. No. 618,650, Feb. 27, 1967, Pat. No. 3,377,826. This application March 27, 1967, Ser. No. 626,289. The portion of the term of this patent subsequent to March 28, 1984, has been disclaimed.
Int. Cl. A41b 9/04
U.S. Cl. 2—224 R **5 Claims**



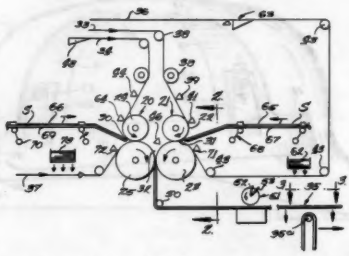
A combination two-legged garment of the type commonly known as "panty hose" including a pair of seamless, sheer, heeless stocking portions knit integrally with and depending from the panty portion. The stocking portions are boarded without the usual heel pocket and are knit of stretchable thermoplastic yarn not in excess of about 30 denier to provide sheerness and sufficient stretchability that the garment can be manufactured and sold in two or three sizes which will fit the full size range.

3,696,445

GARMENT-MAKING METHOD

Grantland A. Craig, Green Bay, Wis., assignor to Paper Converting Machine Company, Inc., Green Bay, Wis.

Continuation-in-part of Ser. No. 28,571, April 15, 1970. This application Dec. 11, 1970, Ser. No. 97,124
Int. Cl. A41d 00/00; A41b 9/00
U.S. Cl. 2—243 **8 Claims**



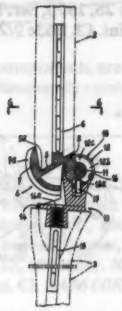
The making of garments from continuous webs wherein at least four webs are advanced simultaneously in two sets to provide left and right garment portions, each portion being approximately one half and including a portion of the front and a portion of the back.

3,696,446

TOTAL KNEE PROSTHESIS

Gilles Bousquet, Ecully, and Andre Rambert, Lyon, both of France, assignors to Association de L'Ecole Catholique d'Arts et Matiers de Lyon, Lyon, France

Filed Jan. 29, 1971, Ser. No. 110,950
Claims priority, application France, Jan. 30, 1970, 7003234
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 6 Claims



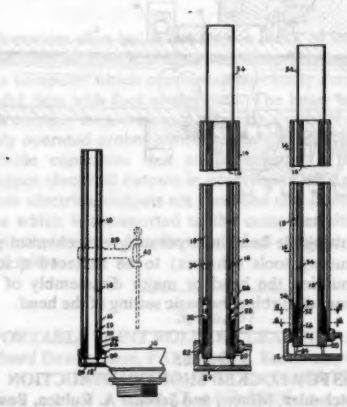
This prosthesis of the knee permits the tibial pivoting movements with due consideration for the two types of rotation, i.e. the systematic inward rotation accompanying the knee flexion and stretching, and the free rotation which can take place only after about 20° of flexion from the normal position of the tibia, the latter being inclined outwards in the stretched knee position, with respect to the thigh-bone extension.

3,696,447

LEAK SEALING DEVICE

Ernest M. McKown, 1313 Acredale Road, Virginia Beach, Va.

Filed April 2, 1970, Ser. No. 25,089
Int. Cl. F16l *15/06, 15/10;* A47k *17/00*
U.S. Cl. 4—1 7 Claims



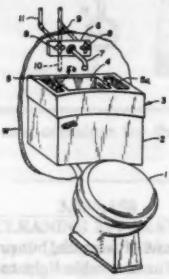
For use particularly in sealing a leak adjacent the lower end of a toilet tank overflow pipe, a tube is inserted into the top of the overflow pipe and carries a deformable packing adjacent its lower end, and a nut threaded on the tube is adapted to be turned downwardly by a tubular tool to deform the packing to seal the leak, whereupon the tubular tool is removed.

3,696,448

LAVATORY-WATER CLOSET COMBINATION

Joseph Carfora, Verona, Pa.

Continuation-in-part of Ser. No. 856,621, Sept. 10, 1969, Pat. No. 3,588,922. This application June 25, 1971, Ser. No. 156,698
Int. Cl. A47k *4/00*
U.S. Cl. 4—3 5 Claims



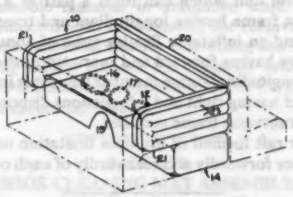
A lavatory for mounting on a flush tank of a toilet, such as used in a powder room or other room involving very limited space. The lavatory replaces the lid of the closet tank and is completely separate from a water faucet connection thereabove to hot and cold water pipes located behind a wall, so as to enable the lavatory to be lifted independently of the faucet when repairs in the closet tank are necessary.

3,696,449

INFLATABLE AUTOMOBILE INTERIOR CONSTRUCTION

William C. Smith, Howard Avenue RR #1, Old Castle, Ontario, Canada

Continuation-in-part of Ser. No. 783,803, Dec. 16, 1968, abandoned. This application Dec. 17, 1970, Ser. No. 99,034
Int. Cl. A47d *7/04;* A47c *19/16*
U.S. Cl. 5—94 5 Claims



A portable inflatable automobile interior construction is disclosed which with conventional automobile seating forms in the automobile a safe rear play area for toddlers; said construction comprises top and bottom inflatable cushion means, said bottom cushion means constructed so that when inflated the same will fill the leg room between the front and rear automobile seats, said top cushion means constructed so that when inflated the same is in part supported upright on said bottom cushion means and will line the back of said front automobile seat and the opposite interior sides of the automobile between said front and rear automobile seats.

3,696,450

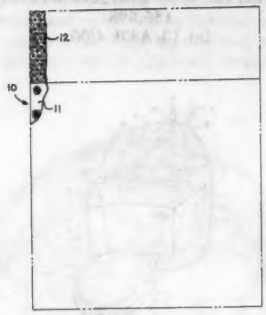
BODY AND HEAD COVERING

Raymond R. Dupler, 744 Euclid, Toledo, Ohio

Filed Sept. 28, 1970, Ser. No. 76,034
Int. Cl. A47g *9/00*
U.S. Cl. 5—334 1 Claim

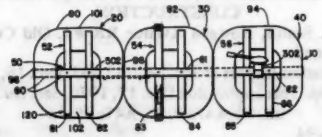
A covering, such as a blanket, to cover a person in which the major portion is of warmth-promoting material woven or

otherwise formed. The end portion of the covering adjacent the head of the person is dimensionally such as to cover the head and is so formed as to permit the passage of air and light. Thus, that end of the covering can be pulled over the head to



afford a limited amount of warmth, but provide adequate air for breathing as well as to enable light to pass through. The end portion may also afford a certain amount of acoustic insulation and this would be useful in a hospital or home where noise would interfere with rest.

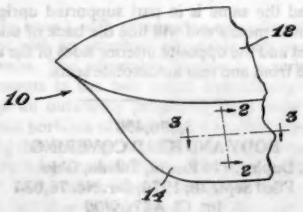
3,696,451
TUBE FLOAT OR BOAT
Howard D. Thompson, 1001 Sixth Street, Dodge City, Kans.
Filed July 2, 1971, Ser. No. 159,367
Int. Cl. B63b 7/08
U.S. Cl. 9—2 A **10 Claims**



A floatation unit which can form a part of a boat or raft comprising a frame having longitudinal and transverse frame members, and an inflatable flexible tube of annular shape in top plan view having forward and rearward portions disposed above the longitudinal frame member when it is in a horizontal position, and having right and left portions disposed below the horizontal transverse frame member.

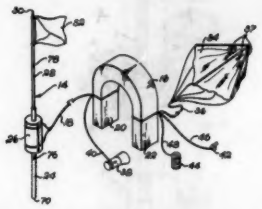
A boat or raft formed of multiple floatation units disposed side by side or forwardly and rearwardly of each other.

3,696,452
HULL CONSTRUCTION FOR VESSELS AND THE LIKE
Earl E. Ziegler, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed March 25, 1970, Ser. No. 22,567
Int. Cl. B63b 5/00
U.S. Cl. 9—6 **10 Claims**



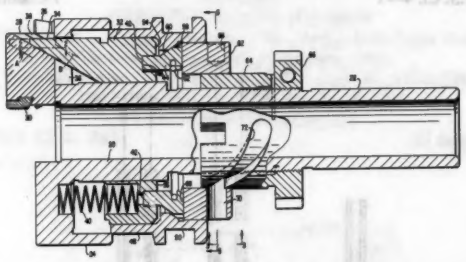
A composite sandwich construction for hulls of water-going vessels and the like wherein a strong but lightweight structure is required. The hull can take compound curvatures without deterioration of structural properties. The sandwich construction comprises a core of oppositely disposed nodular elements forming generally hyperbolic paraboloidal or interrupted hyperbolic paraboloidal structures between the nodular elements, the skins being adhered to the nodular elements.

3,696,453
LIFE SAVING EQUIPMENT
John L. Harris, and Robert W. Hellman, both of Marina Del Rey, Calif., assignors to Del Amo Enterprises, Inc.
Filed May 28, 1970, Ser. No. 41,506
Int. Cl. B63c 9/22
U.S. Cl. 9—14 **6 Claims**



Life saving equipment in which a life buoy and float pole are connected by a line and spring loaded in a container for rapid and substantially simultaneous release. The life buoy may be formed with ends curved in horseshoe manner and a drogue connected by a line to the life buoy may be foldably stored between the buoy ends.

3,696,454
THREAD CUTTING DIE HEAD
Donald E. Youtz, and Edwin M. Eigenbrode, both of Waynesboro, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.
Filed Sept. 10, 1970, Ser. No. 70,995
Int. Cl. B23g 1/00, 5/10
U.S. Cl. 10—95 **2 Claims**

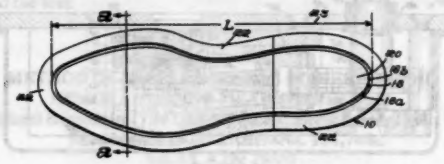


A thread cutting die head incorporating a mechanism permitting the cutting tools (chasers) to be replaced quickly without demounting the head or major disassembly of the head and without disturbing the basic setting of the head.

3,696,455
PROCESS FOR LOCKED SHOE CONSTRUCTION
Charles F. Batchelder, Milton, and Jerome A. Rubico, Boston, both of Mass., assignors to Batchelder-Rubico, Inc., Boston, Mass.
Division of Ser. No. 689,884, Dec. 12, 1967. This application Jan. 7, 1971, Ser. No. 104,756
Int. Cl. A43d 21/00
U.S. Cl. 12—145 **4 Claims**

A shoe construction and process utilizing a prefinished outer sole assembly which is adhesively secured to and locked

in predetermined registration with a tightly lasted shoe upper. The finished shoe is characterized by the absence of any lasting means. In one embodiment of the process, the shoe upper



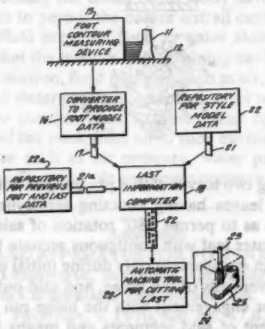
and associated upper components are lasted to a temporary lasting plug which is subsequently removed prior to outsole attaching.

3,696,456

CUSTOM SHOE CONSTRUCTION SYSTEM

Tom David Dunham; Lester Marvin Yeakley, and Andrew Nagy, all of San Antonio, Tex., assignors to International Nominees Bahamas Limited, Nassau, Bahamas

Filed Feb. 22, 1971, Ser. No. 117,451
Int. Cl. A43d 00/00
U.S. Cl. 12—146 L 10 Claims


FOOT CONTOUR MEASURING DEVICE
CONVERTER TO PRODUCE FOOT MODEL DATA
REPOSITORY FOR STYLE MODEL DATA
REPOSITORY FOR PREVIOUS FOOT AND LAST DATA
LAST INFORMATION COMPUTER
AUTOMATIC MACHINE TOOL FOR CUTTING LAST

A custom shoe-last is cut from a block of wood by a tape-controlled automatic milling machine. The tape is produced by a computer which combines empirically derived shoe style model data with foot model data. The latter is derived from foot contour measurements taken by a plurality of simultaneously operated probes connected to the movable elements of variable capacitors that are connected in circuits which produce electrical outputs in accordance with probe position. These electrical outputs are recorded and stored on magnetic tape which is transported to the computer site located at a point remote from the site where foot contour measurements were taken.

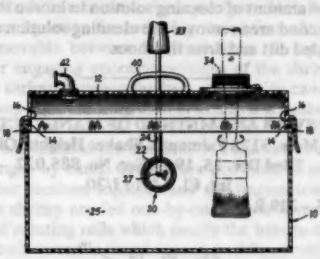
3,696,457

PORTABLE PAINT ROLLER CLEANING APPARATUS

Richard Dewey Hand, P.O. Box 571, East Hampton, N.Y.

Filed April 15, 1970, Ser. No. 28,774
Int. Cl. A46b 17/06
U.S. Cl. 15—4 3 Claims

An apparatus for cleaning paint rollers includes a closed housing in which a roller that has been saturated with a paint solvent can be rotatably mounted. The roller is releasably engaged within the housing by a device attached to the end of an axle. The axle can be rotated to spin the roller dry. Paint and solvent is confined to the interior of the housing throughout the cleaning operation. A hole is provided in the lid of the housing so that paintbrushes can also be inserted and spun dry. When the apparatus is not in use as a paint roller or brush



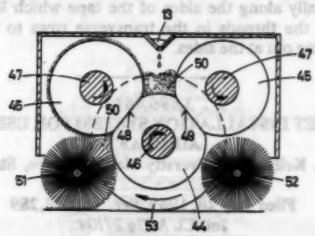
cleaner, it serves as a container for the storage of painting equipment.

3,696,458

CLEANING APPARATUS

Gunter Leifheit, and Johannes Liebscher, both of Nassau/Lahn, Germany, assignors to Leifheit International Gunter Leifheit KG, Nassau-Lahn, Germany

Filed Dec. 2, 1969, Ser. No. 881,440
Claims priority, application Germany, Dec. 2, 1968, P 18 12 081.5
Int. Cl. A47l 11/03
U.S. Cl. 15—50 C 12 Claims



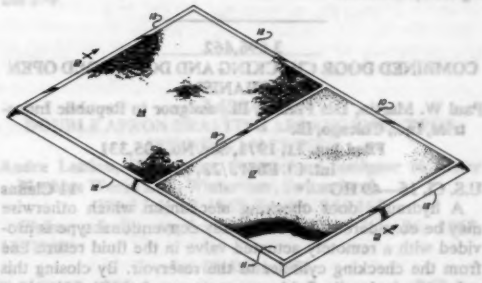
A cleaning apparatus comprises a reservoir for containing a body of foamable material in unfoamed state. Converting means is connected with the reservoir for receiving from the latter unfoamed material and for converting this into foamed state. Moving means mounts the reservoir and converting means for movement over a surface to which the material is to be applied in unfoamed state.

3,696,459

SHOE CLEANING MAT ASSEMBLY

Alfred J. Kucera, 3524 East Glenrosa, Phoenix, Ariz., and Monroe Pulley, Jr., 2327 East Weldon Street, Phoenix, Ariz.

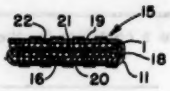
Filed Feb. 12, 1971, Ser. No. 114,893
Int. Cl. A47l 23/22
U.S. Cl. 15—104.92 8 Claims



A floor mat assembly for cleansing and sanitizing ones shoes to prevent tracking dirt from one area to another. The as-

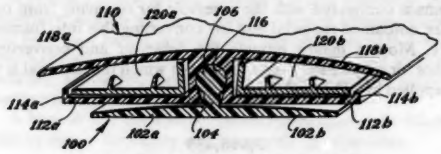
sembly is provided with a first area which moistens the soles of the wearer's shoes by utilizing the wearer's weight to dispense a controlled amount of cleaning solution to loosen the dirt. An adjacent second area removes the cleaning solution along with the suspended dirt and dries the shoes.

3,696,460
MOP SWAB AND METHOD OF MANUFACTURE
Theron V. Moss, 3175 Falmouth, Shaker Heights, Ohio
Filed Dec. 15, 1969, Ser. No. 885,022
Int. Cl. A47l 13/20
U.S. Cl. 15—229 R **16 Claims**



In one form, a tape is secured to one or both sides of the mop cords intermediate their ends, after which the tape with cords attached thereto may be folded in a prescribed manner and restitched through the entire bundle of cords to provide a relatively stiff headband for the mop swab. In another form, the mop cords are first bunched together intermediate their ends and then the tape is wrapped completely around the bundle of cords and stitched thereto using plural rows of stitching extending transversely across the width of the tape and also longitudinally along the sides of the tape which longitudinal rows lock the threads in the transverse rows to keep them from coming out at the sides.

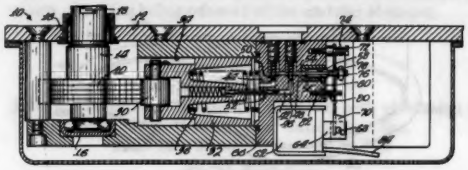
3,696,461
CARPET INSTALLATION SYSTEM FOR USE IN AN AIRCRAFT
Robert G. Kelly, 96 University Heights Drive, Stony Brook, N.Y.
Filed July 28, 1969, Ser. No. 845,289
Int. Cl. A47g 27/04
U.S. Cl. 16—16 **2 Claims**



For use in an aircraft, a carpet installation system comprising a plurality of longitudinally extending extrusions, having laterally extending flange means, is provided for retaining the carpets so that the carpets may be readily removed for cleaning or replacement.

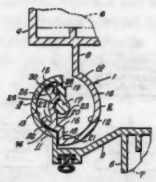
3,696,462
COMBINED DOOR CHECKING AND DOOR HOLD OPEN MECHANISM
Paul W. Martin, Des Plaines, Ill., assignor to Republic Industries, Inc., Chicago, Ill.
Filed Jan. 11, 1971, Ser. No. 105,331
Int. Cl. E05f 3/22, 15/20
U.S. Cl. 16—49 HO **11 Claims**

A hydraulic door checking mechanism which otherwise may be considered as of essentially conventional type is provided with a remotely actuated valve in the fluid return line from the checking cylinder to the reservoir. By closing this valve the hydraulic fluid cannot escape from the checking cylinder, thus preventing closing movement of the door from whatever position it has been opened to until the valve is unseated. Preferably, the valve is of the electromagnetic type which responds to the conditions in as associated control circuit. During opening movement of the door, the hydraulic



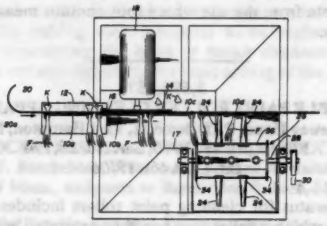
fluid fills the checking cylinder through passages or porting which bypasses the hold open valve. The system is shown as applied to checking door hinges and to door closers of the surface mounted type.

3,696,463
TWO-PART HINGE WITH INTEGRAL PIN
Searcy A. Watson, 2615 Perth Street, Dallas, Tex.
Filed May 11, 1971, Ser. No. 143,698
Int. Cl. E05d 1/04
U.S. Cl. 16—178 **3 Claims**



A hinge having two leaves with a pin integral with the inner leaf, the hinge leaves having coacting semicylindrical segments nested so as to permit 180° rotation of said inner leaf relative to the outer leaf with contiguous arcuate faces of the segments being in engagement only during initial opening and final closing movements of the hinge, and said outer segment having means for engagement with the hinge pin throughout relative movement of said segments and means for engagement with the external arcuate face of the inner segment initial closing and final opening movements of the hinge.

3,696,464
FOWL FOOT REMOVER SYSTEM
Janus J. Dillon, Irving, and Bryan T. Snowden, Grapevine, both of Tex., assignors to Food Equipment, Inc., Dallas, Tex.
Filed Jan. 18, 1971, Ser. No. 106,982
Int. Cl. A22c 21/00
U.S. Cl. 17—11 **11 Claims**



The specification discloses a system for removing fowl feet depending from shackles. The system includes a guide surface mounted in the path of the shackles for positioning the feet generally horizontally. A rotating blade is positioned rear-

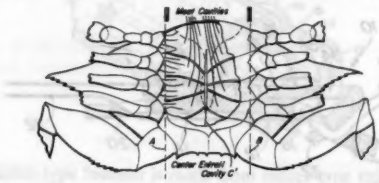
wardly of the guide surface for shearing knuckle portions from the feet. Rotating flexible fingers then strike the remaining portions of the feet on the shackles to propel the feet from the shackles. A hopper is disposed below the rotating blade and the flexible fingers for receiving the severed knuckle portions and the feet.

3,696,465

METHOD OF PREPARING CRAB BODIES FOR THE REMOVAL OF THE MEAT THEREFROM

Michael Rossnan, 11724 Lovejoy Street, Silver Spring, Md.

Filed March 19, 1971, Ser. No. 124,740
Int. Cl. A22c *29/00*
U.S. Cl. 17—48 **6 Claims**



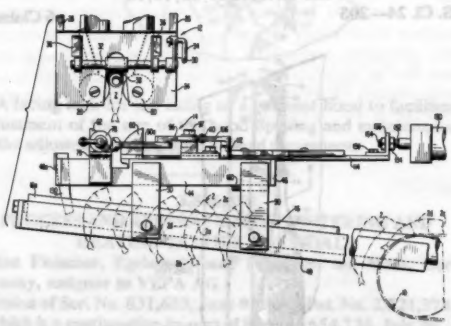
This invention relates to the method for preparing cooked crab bodies for the removal of the contents of the mid-section first, and secondly the meats of the body cavities, by opening these cavities to permit the center entrail cavity to be cleared entirely by fluid pressure, such as water alone or with air or suction, so that the meat in the remaining cavities may also be removed by suction, fluid pressure such as air, water and combined air and water pressure, with means for severing the crab body in two parallel lines to have clear openings for the withdrawal of the meat from all of such cavities by suction, or fluid pressure such as air pressure, water pressure and the combination of suction, air and water pressure, or by hand.

3,696,466

METHOD AND APPARATUS FOR POSITIONING SHRIMP

Herman R. Letchworth, Savannah, Ga., assignor to Seafoods Automation Corporation, Thunderbolt, Ga.

Filed Nov. 9, 1970, Ser. No. 87,836
Int. Cl. A22c *29/00*
U.S. Cl. 17—71 **43 Claims**



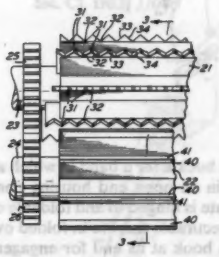
The method of positioning shrimp wherein the shrimp is held in a generally vertical plane with the forward portion of the shrimp located above the tail portion, and opposite portions of the shrimp at the forward end thereof are engaged to rotate the shrimp about its longitudinal axis into a predetermined position. The shrimp is then deposited on a roll conveyor in the predetermined position for conveyance to a shrimp processing apparatus in a predetermined desired position for acceptance by the latter. Apparatus for performing the method includes a pair of elongate holding bars, one of which is axially separable into two sections for receiving shrimp pushed therebetween by a plunger which has a recess in its forward portion for receiving the shrimp. A pair of fingers are movable between the bars from the opposite end thereof for engaging opposite portions of the shrimp to first center the shrimp between the bars and then to cause rotation of the shrimp about its longitudinal axis as it is pushed through the separable bar sections by the plunger. The fingers and separable bar sections are actuated in response to movement of the plunger by cams. Springs are provided to respectfully urge the bar sections together and the fingers towards each other. The shrimp are fed one-by-one between the bars by a first pair of rotating rolls which overly the bars to deposit the shrimp therebetween in timed sequence. After positioning, the shrimp are conveyed away from the bars by a second pair of rotating rolls which carry the shrimp to the shrimp processing apparatus in the desired position.

3,696,467

PROCESS AND APPARATUS FOR PRODUCING YARN

James L. Lohrke, Jr., Birmingham Township, Chester City, Pa., assignor to Turbo Machine Company

Continuation-in-part of Ser. No. 794,238, Jan. 27, 1969, abandoned. This application Dec. 14, 1970, Ser. No. 98,209
Int. Cl. D01g *1/00*
U.S. Cl. 19—.37 **5 Claims**



Process and apparatus for converting a tow composed of a multiplicity of substantially continuous synthetic textile filaments into a sliver or strands of staple length textile fibers by stretch breaking the tow. The tow is evened and portions of the filaments are differentially laterally deflected. The apparatus includes movable deflecting blades in rotating blade holders, said blades having a contour to provide peaks and valleys and a second set of movable blades in rotating blade holders, said blades having straight edges. The blade holders rotate so that the blades of each alternate in engagement with the tow.

3,696,468

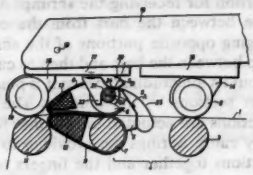
DOUBLE APRON DRAFTING ARRANGEMENT FOR SPINNING MACHINES

Andre Lattion, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed July 28, 1969, Ser. No. 845,161
Claims priority, application Switzerland, July 26, 1968, 11572/68
Int. Cl. D01h *5/86*
U.S. Cl. 19—255 **8 Claims**

The cradle is mounted with respect to the apron rolls and delivery rolls such that a lap formation on the bottom delivery

rolls causes the cage to automatically pivot away from the delivery rolls so as to prevent further feeding of the roving.



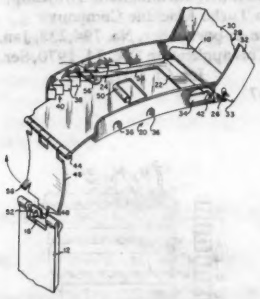
The cradle avoids any pressure being imposed on the bottom apron which might otherwise cause breakage of the apron.

3,696,469

WRIST BAND AND BUCKLE THEREFOR

Harry Kalinsky, 3530 Henry Hudson Parkway, East Bronx, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,261
Int. Cl. A44c 5/24
U.S. Cl. 24—71 J **20 Claims**



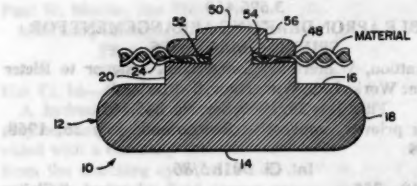
An adjustable buckle for a band in which a plate is telescopically held within an open end housing containing a ratchet and a second plate is hinged to and foldable over the first plate and releasably securable thereto in folded over position and is provided with a hook at its end for engagement of the other end of the band. A pawl is secured to the first plate by a resilient arm which normally maintains the pawl out of engagement with the ratchet. The second plates is provided with a projection which engages the pawl to press it into engagement with the ratchet when the second plate is folded against the first plate.

3,696,470

PLASTIC FASTENER AND METHOD OF SECURING SAME TO MATERIAL

Rolfe E. Reynolds, and Alfred E. Carlile, both of Meadville, Pa., assignors to Textron Inc.

Filed Dec. 8, 1969, Ser. No. 882,979
Int. Cl. A44b 1/18
U.S. Cl. 24—90 **2 Claims**



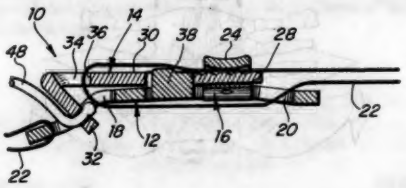
A plastic, single component, button-type fastener having a button portion with a smaller collar and a slender neck extending from the collar to a tapered stem, the tapered stem having a pointed end and a lower surface defining an undercut around the neck with an upper surface of the collar. A method of securing the above described fastener to a piece of material including forcing the stem through the piece of material to position the material in the undercut, cold-heading the stem and partially shearing the cold-headed stem.

3,696,471

RELEASABLE BUCKLE

Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed March 18, 1971, Ser. No. 125,530
Int. Cl. A44b 11/12
U.S. Cl. 24—193 **15 Claims**



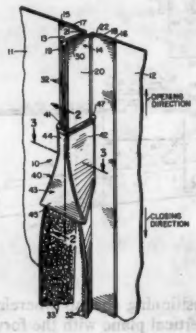
A buckle comprising a frame member formed with strap openings at its ends and a bridge intermediate its ends; and a clamping member pivotally mounted intermediate its ends to the frame member. The clamping member has a tongue at one end extending beneath the bridge for clamping a strap against the bridge and a strap slot near its other end bounded on one side by an edge overlying a strap opening in the frame. This slot edge is further from the pivot axis than the bridge so that a pivotal force applied to the clamping member at the edge by tension on the strap is multiplied to clamp the strap between the tongue and bridge. A spring is mounted on the frame for biasing the tongue toward the bridge and a lanyard is attached to the clamping member for pivoting it to release the strap.

3,696,472

CLOSURE ASSEMBLY WITH SLIDABLE CLOSURE MEMBER

Joseph Perina, Huntington, and Albert E. Hlavaty, Bohemia, both of N.Y., assignors to American Velcro, Inc.

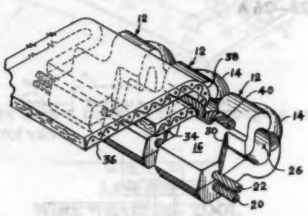
Filed April 15, 1971, Ser. No. 134,216
Int. Cl. A44b 19/00, 19/10
U.S. Cl. 24—205 **6 Claims**



A closure assembly for releasably joining and separating sheet members which are provided with hook type hooking elements and loop type hooking elements is described. The assembly includes two flexible panels, each panel having a semi-rigid angle strip secured thereto and each angle strip having a tape member with projecting hooking elements secured to one

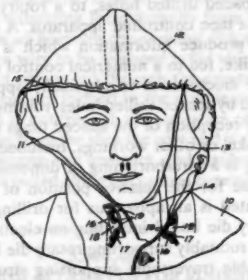
of its legs. A slidable closure member slides along the legs of the angle strips for joining and separating the tape members.

3,696,473
INVISIBLE-TYPE SLIDE FASTENER
Arthur Llewelyn Jones, Glenbrook, New South Wales, Australia, assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed May 20, 1971, Ser. No. 145,251
Int. Cl. A44b *19/34*, *19/02*
U.S. Cl. 24—205.1 6 Claims



Invisible-type fastener is made from ladder-type strip. Projections on edge of each fastening element are engaged by attaching thread to hold each element against lateral slippage with respect to tape.

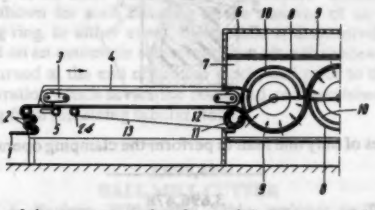
3,696,474
LACING LOCK FOR HOOD
John Slauta, Natick, Mass., assignor to The United States of America as represented by the Secretary of the Army
Filed Dec. 17, 1970, Ser. No. 99,171
Int. Cl. A41f *1/00*; A41d *3/02*
U.S. Cl. 24—266 7 Claims



A lacing lock for the lacing of a garment hood to facilitate adjustment of the size of the hood opening and maintenance of the adjusted size regardless of head movements.

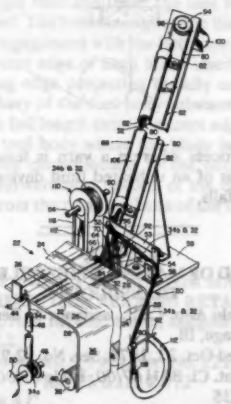
3,696,475
PROCESS AND APPARATUS FOR TENTERING AND HEATING TEXTILE MATERIALS
Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to VEPA AG
Division of Ser. No. 831,683, June 9, 1968, Pat. No. 3,521,378, which is a continuation-in-part of Ser. No. 654,728, July 20, 1967, Pat. No. 3,503,134. This application Nov. 21, 1969, Ser. No. 877,566
Claims priority, application Germany, June 8, 1968, P 17 60 604.1; June 22, 1968, P 17 60 717.9; June 27, 1968, P 17 60 751.1; April 8, 1969, P 19 17 757.2
Int. Cl. D06c *3/02*
U.S. Cl. 26—60 13 Claims

The present disclosure is directed to an apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means associated with the sieve drum means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed



outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, a supporting means disposed below the tensioning chains for supporting the material disposed on said chains so that the material is conveyed on the underside of the chains, and outlet means for removing the material being treated from the treatment chamber.

3,696,476
PICK REMOVER
James R. Mildon, Taylors, S.C., assignor to Commercial Affiliates, Inc., New York, N.Y.
Filed Dec. 19, 1969, Ser. No. 886,434
Int. Cl. D03j *1/04*
U.S. Cl. 28—17 25 Claims

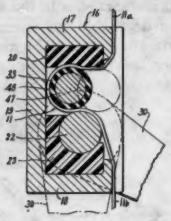


A part of, or an accessory for, a loom for weaving a looped pile fabric or the like which requires picks or the like for looping the fabric, including means to remove the picks comprising a belt with hooks to engage the picks for relative movement to a handling station while they are being removed from the woven material, and means to draw the picks from the handling station to a disposal station.

3,696,477
WARP CLAMP
Franklin L. Townsend, Rockford Twp., Winnebago County, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed May 10, 1971, Ser. No. 141,549
Int. Cl. D03j *1/16*
U.S. Cl. 28—44 12 Claims

A warp clamp draws the warp sheet between relatively fixed

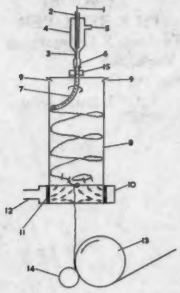
jaws of the clamp by a rolling action and usually requires the services of only one man to perform the clamping operation.



3,696,478
TREATMENT OF YARNS

David Robert Elliott, and John Michael Greenway, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 31, 1969, Ser. No. 889,517
Claims priority, application Great Britain, Sept. 23, 1969, 46,828/69
Int. Cl. D02g *1/00*
U.S. Cl. 28—72.1 14 Claims

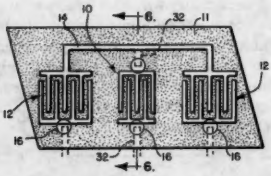


Yarn relax process wherein a yarn is tensioned and forwarded by means of an unheated fluid device to a hot zone wherein tension falls.

3,696,479
METHOD OF MAKING A PIEZOELECTRIC TRANSDUCER

Fleming Dias, Palo Alto, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 22, 1970, Ser. No. 82,920
Int. Cl. B01j *07/00*; H04r *07/00*
U.S. Cl. 29—25.35 9 Claims

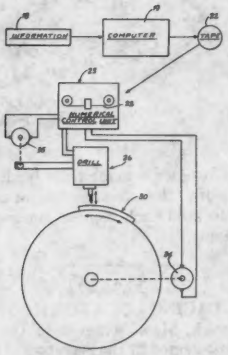


For connecting external leads to miniature solid-state devices of the type wherein an electric circuit element is photoetched, printed or otherwise bonded upon a substrate surface, lands are embedded in the substrate and exposed to the circuit supporting surface of the substrate. The lands provide a surface large enough to enable the circuit elements and external leads to be individually connected to separated regions of the exposed portion or portions of the lands.

3,696,480
METHOD OF AND APPARATUS FOR ACCURATELY WORKING ROTARY DIE BOARDS TO RECEIVE CUTTING RULE

Louis E. Sauer, and Orville C. Miller, both of St. Louis, Mo., assignors to Centenary Central, Inc., St. Louis, Mo.

Filed July 9, 1969, Ser. No. 840,384
Int. Cl. B21k *5/20*
U.S. Cl. 29—26 A 10 Claims



There is disclosed a method of and apparatus for developing on tape and applying a preselected rotary die design, etc., defined by spaced drilled holes, to a rotary die board automatically by a tape controlled apparatus. A computer is programmed to produce information which is transferred to a tape, or the like, fed to a numerical control machine to energize selected mechanisms to physically apply a preselected design formed by spaced drilled holes, routing, etc., to a rotary die board for reception of the spaced tangs or legs of cutting rule, or the like, or other workings. Included in the computer programming is a foreshortening of dimensions, as required, to compensate for the relative position of the cutting rule edge. Illustrated is an apparatus for drilling or drilling and routing rotary die board including an electrically actuatable structure for rotatably supporting rotary die board, an electrically actuatable traversable supporting structure for a drill head, and an electrically actuatable drill head adapted to execute desired reciprocable movements and to drill spaced holes and to rout, as signaled.

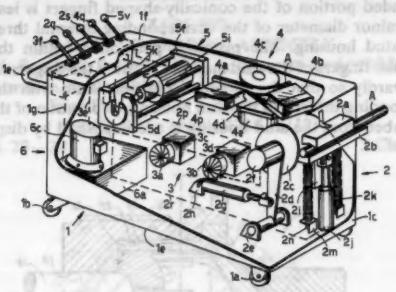
3,696,481
APPARATUS FOR PERFORMING OPERATIONS ON HYDRAULIC TUBING

Paul Schmidt, Hauptstrasse 150, Saalhausen, Germany

Filed Nov. 16, 1970, Ser. No. 89,584
Claims priority, application Germany, Nov. 15, 1969, P 19 57 566.7
Int. Cl. B23p *23/04*
U.S. Cl. 29—33 T 21 Claims

Apparatus for performing a number of operations on hydraulic tubing in the construction of hydraulic installations is mobile and includes a mechanical bending device, a mechanical cut-off device for cutting the tubing to length, a de-burring device for removing the burrs from the ends of the tubing after it has been cut and a device for securing coupling parts to the ends of the cut-off lengths of tubing. All of these

devices are driven by hydraulic drives, consisting of rams or motors and all of the drives are supplied with hydraulic fluid



under pressure from a common pump through a number of separate control valves.

3,696,482

WIRE WRAPPING TOOL

Thomas George Tumilty, Bramalea, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed May 6, 1971, Ser. No. 140,840
Int. Cl. B21f *15/00*
U.S. Cl. 29—33 F 9 Claims

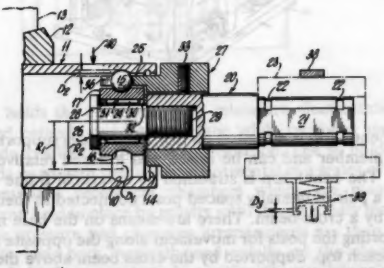
Wire wrapping tool for wrapping wires on terminal posts, and similar uses, the tool having a bit rotatable in a sleeve. The bit has a groove extending longitudinally from its front end and the sleeve has an aperture cooperating with the inner end of the groove. The wire to be wrapped is fed along the groove until the wire end comes out through the aperture. Two opposed cutting edges are formed in the groove near the outer end of the groove to cut through the insulation of the wire. As the bit is rotated to wrap the wire the wire end is sheared by interaction of the groove and aperture, and insulation is peeled off the wire as it is pulled along the groove between the cutting edges.

3,696,483

METHOD AND APPARATUS FOR FINISHING AN ANTIFRICTION-BEARING RACEWAY

Charles R. Burk, Collinsville, Conn., assignor to Textron Inc., Providence, R.I.

Filed Jan. 21, 1971, Ser. No. 108,463
Int. Cl. B24b *39/00*
U.S. Cl. 29—90 19 Claims



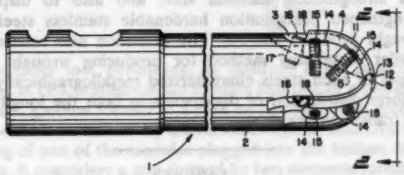
The invention contemplates a method of burnishing a raceway surface for balls or like elements in an antifriction bearing, wherein the burnishing proceeds on a machined raceway surface, in the course of radially compressing an antifriction element between a reference raceway and the unfinished raceway, all while maintaining continuous rolling contact of the element in the two raceways. A specific tool illustrates use of the method in application to ball-bearing races, one embodiment being shown for such finishing of the raceway of an inner-bearing ring, and another embodiment being shown for such finishing of the raceway of an outer-bearing ring. In either event, the method is illustratively performed on an automatic screw machine, after the raceway has been turned at the end of tubular stock, and prior to the cut-off operation which severs the machined and burnished bearing ring from remaining tubular stock.

3,696,484

BALL MILL CUTTER

Frank A. Spriggs, Willoughby, Ohio, assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Feb. 22, 1971, Ser. No. 117,419
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 R 10 Claims



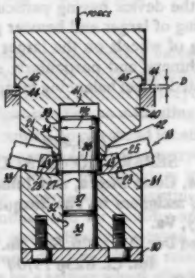
Ball mill cutter includes plural cutting blade inserts retained in circumferentially spaced slots in the forward end of the tool body, such slots having a flat bottom wall extending rearwardly at an angle from the tip of the tool body to the outer periphery thereof. The bottom edge of the blade inserts is also flat for mating engagement with the bottom wall of the angular slots, and the outer edge of each blade insert is contoured to provide a cutting edge projecting radially outwardly beyond the outer periphery of the tool body substantially to the same extent along the full length thereof except adjacent the axis of rotation of the tool body where the blade inserts have a flat portion extending perpendicular to the bottom edge which terminates the forwardmost portion of the cutting edge radially outwardly from the rotational axis of the tool body.

3,696,485

METHOD AND APPARATUS FOR MAKING AN ANTIFRICTION BEARING RETAINER

Karl F. Radune, New Britain, Conn., assignor to Textron Inc., Providence, R.I.

Filed March 5, 1971, Ser. No. 121,265
Int. Cl. B21d *53/12*
U.S. Cl. 29—148.4 C 14 Claims



The invention contemplates a retainer ring for maintaining the angular spacing of rolling elements in an antifriction bear-

ing, said ring being the product of a method and apparatus for precisely staked definition of element-retaining lugs prior to assembly of the rolling elements thereto. The ring material displaced by staking is limited by anvil formations which determine the precise spacing. Tolerances may be so closely set and held that rolling-element assembly to such a retainer ring involves only light radial pressure to transiently but not permanently deform the lug regions in a snap or detent action. The invention is described in application to roller-element retention and to ball-element retention, whether the retention is to be against radially inward loss (of rolling elements) or radially outward loss, or both.

3,696,486

STAINLESS STEELS BY POWDER METALLURGY

John Stanwood Benjamin, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 709,700, March 1, 1968, Pat. No. 3,591,362. This application Aug. 25, 1969, Ser. No. 852,824

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.5 **5 Claims**

This invention relates to the powder metallurgy of dispersion strengthened stainless steel and also to dispersion strengthened precipitation hardenable stainless steels and wrought products thereof. The invention also relates to a powder metallurgy method for producing wrought metal shapes of such steels characterized metallographically by a uniform distribution of dispersoids in both the longitudinal and transverse directions.

3,696,487

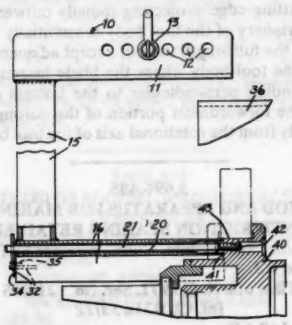
LOADER FOR MOUNTING GRINDING WHEELS

Theodore A. Mrugala, Auburn, and Henry Kruck, Leominster, both of Mass., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 10, 1970, Ser. No. 71,003

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 D **4 Claims**



A device for assisting in the mounting or removing of a grinding wheel, the device having particular utility for assisting in the handling of larger and heavier grinding wheels during the changing of wheels on the larger kinds of automated production machinery and particularly on machines having wheel hub mounted wheel balancing means.

3,696,488

SEPARATION SYSTEM

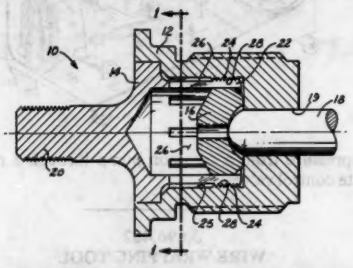
Michael F. Steele, Costa Mesca, and John S. Yates, Placentia, both of Calif., assignors to The Susquehanna Corporation, Fairfax County, Va.

Filed Dec. 21, 1970, Ser. No. 99,917

Int. Cl. B23p *19/04*

U.S. Cl. 29—200 D **13 Claims**

A mechanical separation system is disclosed which includes a stud member and a stud housing maintained in mating engagement by a piston. The stud member has a plurality of externally-threaded segments fingers which can be formed in an overall conical shape so that the major diameter of the threaded portion of the conically-shaped fingers is less than the minor diameter of the corresponding internal threads in the stud housing. The piston is positioned within the segmented fingers of the stud member to force the fingers radially outwardly so that the threaded portions mate with the corresponding threads in the stud housing. Separation of the stud member from the stud housing is accomplished by displacing



the piston to allow the stud fingers to move inwardly to assume a conical shape. The externally threaded portion of the stud member is thus disengaged from the internal threads of the stud housing to permit separation of the stud member from the stud housing. In an alternative embodiment, the fingers of the stud member are not formed into a conical shape prior to use, but the energy imparted to the fingers as they are threaded into the stud housing is sufficient to cause the fingers to be deflected inwardly and to disengage from the housing when the piston member is forced out of contact with the end portions of the fingers.

3,696,489

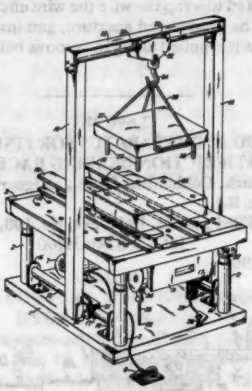
DIE ASSEMBLY AND DISASSEMBLY BENCH

John C. Vecchi, Natrona Heights, Pa., assignor to Oberg Manufacturing Co., Inc., Freeport, Pa.

Filed May 19, 1971, Ser. No. 144,887

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 D **9 Claims**



A bench top is mounted on telescoping legs supported by a base member and can be raised and lowered relative to the base. The bench top is straddled by a vertical frame formed from a pair of laterally spaced posts connected at their upper ends by a cross beam. There are means on the base member supporting the posts for movement along the opposite sides of the bench top. Supported by the cross beam above the bench is a trolley that is movable along the beam and from which the top section of a die can be suspended while the bottom section

of the die is supported by the bench top and raised or lowered by it.

3,696,490
CLAMP FOR BEARING ASSEMBLY

Kenneth Secunda, Detroit, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

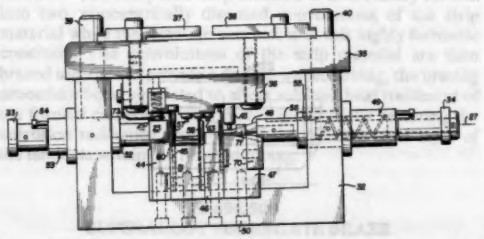
Filed Feb. 4, 1971, Ser. No. 112,745
Int. Cl. B23p *19/04*; B21d *53/12*
U.S. Cl. 29—201 **2 Claims**

A three legged wire clamp for a bearing assembly comprised of a double shouldered race member, a plurality of roller bearings positioned in the race member, an unwelded metal retainer strip which is circular in shape in the form of a split ring and hence contains a gap which is subsequently welded to secure the retainer strip in position, and a wire clamp means which inwardly biases the retainer to hold the retainer and bearings in a properly oriented position prior to welding.

3,696,491
ASSEMBLY JIG FOR MINIATURE ELECTROSTATICALLY DEFLECTED CATHODE RAY TUBES

Horst H. Blumenberg, Owensboro, and Francis W. Francillon, Maceo, both of Ky., assignors to Kentucky Electronics Inc., Owensboro, Ky.

Filed Dec. 22, 1970, Ser. No. 100,624
Int. Cl. B23q *3/18*; B23p *17/04*; B25b *1/20*
U.S. Cl. 29—203 J **8 Claims**

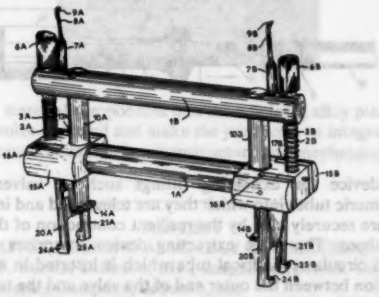


A jig holds the electrodes of a miniature electrostatically deflected cathode ray tube in place while receiving molten glass rods to affix the electrodes in position. The jig holds the electrode parts with the tube axis horizontal in a series of slots and contoured receptacle chambers which are manually loaded and held in place by gravity until the jig is fully loaded. Separate pressure pad clamping arrangements are then positioned to bear both vertically and axially on the electrode parts to hold them precisely in position for receiving molten glass rods.

3,696,492
TOOLS FOR PLUGGING IN AND UNPLUGGING SUBSYSTEMS CARRIED ON SLIDEWAYS

Marcel Baillard, Seine, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed March 9, 1971, Ser. No. 122,389
Claims priority, application France, March 18, 1970, 7009752
Int. Cl. B25b *27/02*
U.S. Cl. 29—203 H **5 Claims**

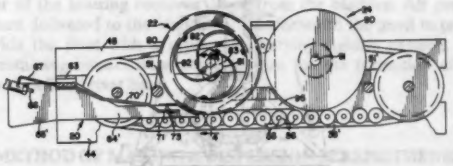


A portable tool permitting, as desired, either selective plugging in of a printed-circuit module into one of a plurality of bottom grooves formed in a rack and above which groove the module is restrained by lateral slideways, or selective unplugging of one of the modules plugged into the bottom rack grooves. It comprises a grip formed by two elements movable relatively to each other. One of these elements is provided with a pair of claws adapted to engage lateral recesses in the rack when the operator moves the two grip elements toward each other. The other element is provided on the one hand, with pushing rods acting on the module to be plugged and, on the other hand, with hooks acting on the module to be unplugged, after having turned the grip the other way round.

3,696,493
AEROSOL VALVE ASSEMBLY LOCATING AND SETTING APPARATUS

George E. Leonard, Davenport, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Dec. 28, 1970, Ser. No. 101,504
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 B **19 Claims**



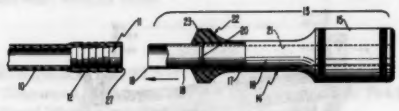
An apparatus for locating and setting valve closure cap assemblies on aerosol containers which apparatus is adapted to be combined with a horizontal bottom conveyor for advancing the containers in upright position to a locating and setting station where there is mounted an overhead locating wheel with a peripheral groove for engaging the valve carrying closures and locating the assemblies in the top openings in the containers and associated guide members for assisting in the proper locating of the assemblies and for guiding and steadying the containers while the assemblies are located in the openings and subsequently forced down in seating relation on the rims defining the openings by a setting wheel which is mounted immediately adjacent the locating wheel in the path of advance of the containers.

3,696,494

VALVE EXTRACTOR

Henry H. Mackal, Fort Lauderdale, Fla., and Kenneth P. Behnke, New Milford, N.J., assignors to Halkey-Roberts Corp., Parmans, N.J.

Filed March 8, 1971, Ser. No. 121,729
Int. Cl. B23p 19/04
U.S. Cl. 29—213 9 Claims



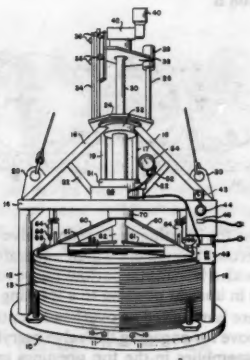
A device for extracting fittings such as valves from elastomeric tubes into which they are telescoped and in which they are securely held by the resilient contraction of the tube thereabout. The valve extracting device comprises a thin-walled circular cylindrical tube which is inserted in an axial direction between the outer end of the valve and the tube and is progressively thrust therebetween. During this operation the tube is progressively freed from the valve, so that the valve may finally drop downwardly through the axial passage in the tool and thus be recovered. The elastomeric tube is then pushed off the thin-walled tubular portion of the extractor by a collar or sleeve which is slidably mounted upon the thin wall of the extractor so as to engage the outer free end of the elastomeric tube and to thrust it axially along the thin wall of the extractor.

3,696,495

THREADED RING TURNING DEVICE

Alvin R. Synstad, Clifton, Va.; Luther M. Burges, Frederick, and Paul P. Day, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 5, 1971, Ser. No. 131,233
Int. Cl. B23p 19/04
U.S. Cl. 29—240 8 Claims



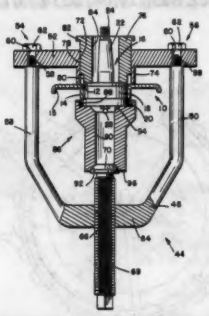
The invention is a device to support the weight of a threaded ring as it is rotated so that the threads on the threaded ring and corresponding threads on the tank receiving the threaded ring are not rubbing but are balanced in the tolerance of the threaded fit.

3,696,496

EXTRACTOR AND PUSHER

Joe B. Corder, 3802 Cossell Road, Indianapolis, Ind.

Continuation-in-part of Ser. No. 811,309, March 28, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 99,745
Int. Cl. B23p 19/04
U.S. Cl. 29—260 9 Claims



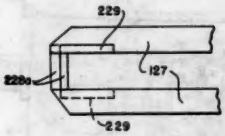
For use in inserting and removing devices, such as ball joints, which are conventionally pressed into openings in members, an apparatus comprising rigid frame means including a frame plate adapted to be disposed on one side of such a member and a frame portion adapted to be disposed on the opposite side of such a member. The frame plate provides an opening positioned to be registrable with the opening in such a member. Drive means, such as a jacking screw, is carried by the frame portion and adapter means is provided for operatively connecting the drive means to such a device.

3,696,497

METHOD OF MAKING A BACKING STRIP FOR A WIPER BLADE

William J. Quinlan, and Lawrence L. Huver, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

Continuation-in-part of Ser. No. 883,928, Dec. 10, 1969, Pat. No. 3,616,485, which is a continuation-in-part of Ser. No. 725,325, April 30, 1968, Pat. No. 3,541,629. This application Nov. 19, 1970, Ser. No. 90,938
Int. Cl. B23q 17/00; B23p 11/02
U.S. Cl. 29—407 5 Claims



A flexible wiper element supported by a resiliently flexible backing strip. In some embodiments the wiper element and backing strip are bonded together. In other embodiments the backing strip includes a pair of transversely spaced strip members which retain the wiper element therebetween. Longitudinal edge portions of the backing strip are embraced by the usual claws of a wiper pressure unit, and longitudinally spaced detents are provided on the backing strip to releasably or snap-fittingly receive one of the claws between them, whereby to releasably hold the blade unit and pressure unit in assembled relation.

3,696,498

PRETREATMENT OF METAL SHEETS WHICH ARE COATED AFTER A FORMING OPERATION

Lambis Leontaritis, Cologne; Nikolaus Schon, Leverkusen; Hans Hoffmann, Leichlingen, and Aziz El Sayed, Schildgen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1970, Ser. No. 94,976

Claims priority, application Germany, Dec. 4, 1969, P 19 60 817.4

Int. Cl. B21b *45/02*; B44d *1/34*

U.S. Cl. 29—424 7 Claims

This invention relates to an improved process for the pretreatment of metallic materials wherein the material is subjected to a surface treatment, subsequently covered with a removable layer of a water soluble, film-forming organic polymer, formed and provided with a firmly adhering protective layer.

3,696,499

METHOD FOR MAKING A COMPOSITE TUBE

John A. Dromsky, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1970, Ser. No. 100,007

Int. Cl. B23k *31/02*

U.S. Cl. 29—476.5 11 Claims

A strip of composite metal laminate material embodying a thin inner layer of stainless steel sandwiched between and metallurgically bonded to two relatively thicker outer layers of low carbon steel is subjected to a brief, high temperature heat treatment followed by a relatively much longer heat treatment at much lower temperature for substantially eliminating the yield point in the laminate and for maximizing formability of the laminate while permitting some reduction in the corrosion resistance properties of the stainless steel layer of the laminate. The composite strip material is then readily formed into two, concentrically disposed convolutions of the strip material while the laminate material is in this highly formable condition. The convolutions of the strip material are then brazed together to provide a double-walled tubing, the brazing procedure being regulated to effect selected heat treatment of the formed composite material for substantially restoring the corrosion resistance properties of the stainless steel layer of the laminate within the finished tubing.

3,696,500

SUPERALLOY SEGREGATE BRAZE

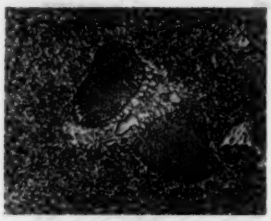
Lemuel A. Tarshis, Latham; James L. Walker, Schenectady, both of N.Y., and Thomas F. Berry, Cincinnati, Ohio, assignors to General Electric Company

Filed Dec. 14, 1970, Ser. No. 97,915

Int. Cl. B23k *31/02*

U.S. Cl. 29—487 11 Claims

A method of forming an integral joint bonding together superalloy pieces, and brazing alloy composition therefor. The process includes steps to locate and determine the chemical composition of the lowest melting segregate of a superalloy piece to be bonded, applying a prepared brazing material consisting essentially of said lowest melting segregate, and heating the pieces to be joined together with the brazing material. Subsequent progressive heat treatment of the pieces with the brazing material therebetween diffuses and solutionizes the



brazing material components into the adjoining alloy pieces to homogenize the bond and make the joint zone an integral part of the joined members in microstructure and mechanical properties.

3,696,501

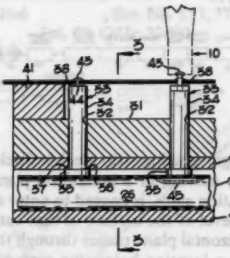
RIVET BUCKING ASSEMBLY AND METHOD

James D. Burtin, Lebanon, Mo., assignor to Detroit Tool and Engineering Company, Lebanon, Mo.

Filed Oct. 24, 1969, Ser. No. 869,213

Int. Cl. B21d *39/00*; B23p *11/00*

U.S. Cl. 29—509 6 Claims



This rivet bucking assembly is used in a system employing a reciprocating rivet gun. The assembly includes a support housing containing a pneumatic bladder receiving air at a controlled, variable pressure. An anvil member, mounted in slidable relation within an aperture communicating with the interior of the housing receives thrust from the bladder. Air pressure delivered to the bladder is transferred to the anvil to provide the rivet with a support of varying rigidity capable of sustaining impact from the rivet gun for the formation of a well defined rivet head.

3,696,502

METHOD OF MAKING A DISPERSION STRENGTHENED METAL

Alan Sydney Darling, Northwood, Middlesex, England, assignor to Johnson Matthey & Company Limited, London, England

Continuation of Ser. No. 839,985, July 8, 1969, abandoned. This application July 14, 1969, Ser. No. 861,522

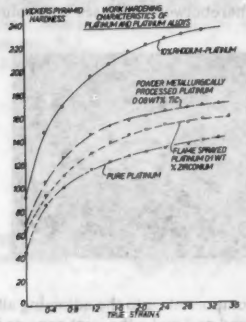
Claims priority, application Great Britain, July 12, 1968, 33,392/68

Int. Cl. B23k *19/00*

U.S. Cl. 29—527.7 16 Claims

A method of making a dispersion strengthened metal or alloy in accordance with this invention consists in spraying a molten metal material and a reactive constituent on to a target. The reactive constituent is passed through an atmosphere which converts it into a material which forms a dispersion

phase within the host material when the latter is deposited on the target. A dispersion strengthened metal or alloy made in


VICKERS PYRAMID HARDNESS
WORK HARDENING CHARACTERISTICS OF PLATINUM AND PLATINUM ALLOYS
10% RHODIUM-PLATINUM
POWDER METALLURGICALLY PROCESSED PLATINUM 0.08 WT% TiO2
FLAME SPRAYED PLATINUM 01 WT % ZIRCONIUM
PURE PLATINUM
TRUE STRAIN %

accordance with this method possesses improved mechanical properties and increased strength at high temperatures.

3,696,503

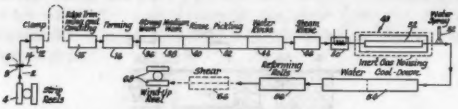
METHOD FOR CONTINUOUSLY GALVANIZING STEEL STRIP

Theodore H. Krengel, Flossmoor; Arthur E. Ostrowski, Alsip, and Anthony J. Raymond, Olympia Fields, all of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Oct. 28, 1969, Ser. No. 871,917

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.4 **8 Claims**



A method of galvanizing strip steel is disclosed in which a continuous strip moving in a horizontal plane, after passing through preparation steps, is caused to enter a bath of molten zinc below the level of the surface of that bath. The strip still moving in a horizontal plane passes through the bath and exits therefrom from a location below the surface. After cooling, the strip may be coiled or partially roll-formed and cut to desired lengths. The disclosure includes the steps of forming or partially forming the strip prior to its entry into the bath.

3,696,504

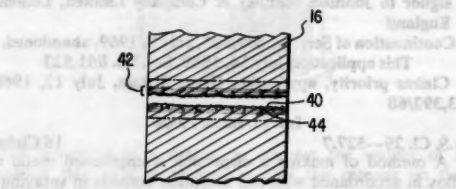
METHOD OF PERFORMING SEQUENTIAL NON-MECHANICAL AND MECHANICAL MACHINING OPERATIONS ALONG A COMMON CENTERLINE

John A. Cupler, II, 10 Cupler Drive, LaVale, Cumberland, Allegany County, Md.

Continuation of Ser. No. 800,237, Feb. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 715,711, March 25, 1968, Pat. No. 3,478,419. This application Aug. 11, 1971, Ser. No. 171,004

Int. Cl. B23p *13/04*

U.S. Cl. 29—558 **12 Claims**



The disclosure relates to a method of drilling holes in difficulty machinable material wherein non-mechanical means, such as a laser or an electron beam, is used to drill a first undersize hole which is characterized by a surrounding recast area followed by a mechanical reaming operation to remove the recast area and produce a finished bore in the material which then reveals no metallurgical alteration.

3,696,505

UNILATERALLY METALLIZED ELECTRET FOIL

Jan Van Turnhout, Delft, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoik ten behoeve van Nijverheid, Handel en Verkeer the Hague, Netherlands

Filed July 1, 1969, Ser. No. 838,110

Claims priority, application Netherlands, July 10, 1968, 6809738

Int. Cl. H01s *4/00*

U.S. Cl. 29—592 **2 Claims**

The method for the manufacture of a unilaterally metallized electret foil wherein a double spiral, made up of a first unilaterally metallized foil, the metallized surface of which abuts with the non-metallized surface of a second unilaterally metallized foil, is first heated, then a direct voltage is connected to the two metal layers and next the double spiral is cooled down to room temperature. The tension between the layers is removed, the double spiral is unwound and the foils are taken apart.

3,696,506

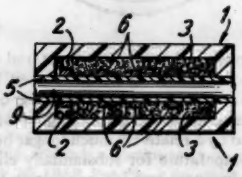
METHOD OF MAKING A MEMORY PLANE WITH POWDERED KEEPERED MATERIAL

William Y. Sinclair, Frenchtown, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Nov. 16, 1970, Ser. No. 89,955

Int. Cl. H01f *7/06*

U.S. Cl. 29—604 **6 Claims**



A memory plane includes a keepered word line structure formed by two cooperating molded assemblies, both having recesses for accommodating loose particles of magnetically conductive, but electrically non-conductive material. A contoured word strap assembly is partially disposed in each of said molded assemblies, after which the molded assemblies are joined together whereby the peaks of the contoured word strap assemblies define tunnels in which magnetically coated wires may be inserted, thereby completing the construction of the keepered memory plane.

3,696,507

METHOD AND APPARATUS FOR MAKING ELECTRIC HEATERS

Robert W. Unger, and Wallace H. Sunderman, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.

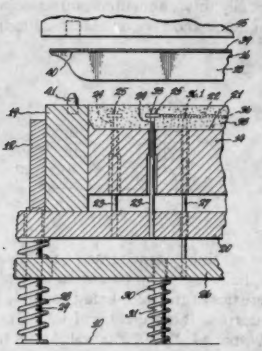
Filed March 22, 1971, Ser. No. 126,503

Int. Cl. H05b *3/00*

U.S. Cl. 29—611 **11 Claims**

An improved method, and apparatus, for forming strip heaters wherein the heating resistor is disposed in centered relation within a cake of compressed refractory material in a single operation. The invention includes a cavity in a mold in which the resistor is supported on winding pegs and electri-

cally connected to terminals. The base of the sheet metal channel of the heater to be formed is placed in juxtaposed relation with the cavity opening, and this base is pressed toward the cavity to compress refractory material and a binder



within the cavity. The winding pegs are withdrawn from the mold cavity during the pressing operation to strip the resistor therefrom and leave the latter centered in the compressed cake of refractory material contained within the heater channel.

3,696,508

SHEARING SYSTEM FOR DRY SHAVERS

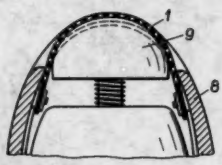
Werner Messinger, Kronberg, Taunus, Germany, assignor to Braun A.G., Frankfurt/Main, Germany

Filed Aug. 20, 1970, Ser. No. 65,391

Claims priority, application Luxembourg, Aug. 26, 1969, 59,350

Int. Cl. B26b *19/04*

U.S. Cl. 30—43 **15 Claims**



A shearing foil for use with a dry shaving apparatus as an upper cutter having a major hole field formed therein, for allowing entry of the hair thereinto, such hole field containing a plurality of hole-like apertures having a predetermined lateral extension, a plurality of slots having a predetermined length, the length of each of the slots being greater than the largest dimension of the lateral extension of each of the hole-like apertures, the hole-like apertures and the slots being formed in the body of the foil in a mixed fashion and being separated from each other by strips resulting from the formation of adjacent ones of hole-like apertures and the slots.

3,696,509

DIES FOR CUTTING ELECTRICAL CABLE

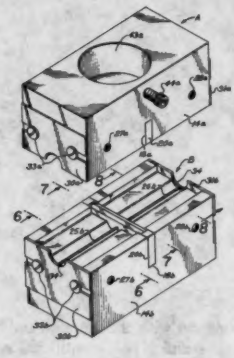
Robert W. Lancaster, Haven, Kans., assignor to Panhandle Eastern Pipe Line Company, Houston, Tex.

Filed Sept. 10, 1970, Ser. No. 71,008

Int. Cl. B26b *17/02*

U.S. Cl. 30—90.6 **1 Claim**

Two mating die bodies are each equipped with cutoff blades that mate when the die bodies are moved together. With an electric cable between the die bodies, these blades cut the cable. Also carried by each of the die bodies are indenting blades that form circumferential indentations and longitudinally extending indentations in the insulation around the conductor of



the cable. This allows the insulation to be stripped from the conductor easily and rapidly after the cable has been cut.

3,696,510

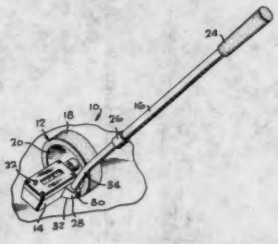
MEASURING WHEEL CONSTRUCTION

Wallace D. Evans, Jr., Malibu, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.

Filed , Ser. No. 111,377

Int. Cl. G01c *22/00*

U.S. Cl. 33—141 R **2 Claims**



A measuring wheel construction wherein the rotatable wheel is mounted upon a conical recessed hub, a counter mechanism is secured to the wheel and extends within the recessed hub, the counter mechanism being adapted to record the rotational movement of the wheel, a tubular handle is secured to the counter mechanism by an attaching bracket, the bracket is relieved to not interfere with the surface being measured, the handle being outwardly curved adjacent the bracket.

3,696,511

BELT MEASURING DEVICE

William L. Bixler, Littleton, and Harold C. Voss, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

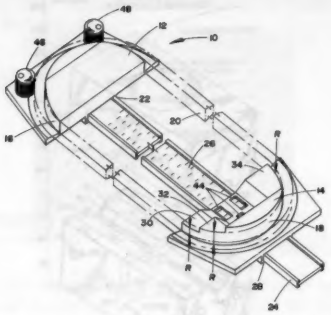
Filed April 23, 1971, Ser. No. 136,689

Int. Cl. G01b *5/00*

U.S. Cl. 33—125 R **4 Claims**

A device for establishing an outside circumference identification for V-belts. The device includes two semi-cylindrical members reciprocally separable from each other along a stick which has its length divided into a plurality of scales. An arcu-

ate stepped reference on one of the members provides means for gauging the top width of a plurality of V-belts. A pointing



means in cooperation with the stepped reference indicates a circumference or specified belt identification on the scales.

3,696,512

EXTENSOMETER

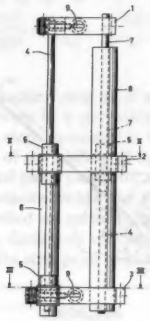
Silvio M. N. K. W. F. von Marinelli; Jules Herman Vree, and Joannes B. Verboom, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed March 3, 1970, Ser. No. 16,198

Claims priority, application Netherlands, March 6, 1969, 6903437

Int. Cl. G01b 5/00

U.S. Cl. 33—147 D **4 Claims**



An extensometer having a pair of platforms movable relative to each other by a guide pin and guide sleeve arrangement. The platforms are substantially U-shaped with the guide pins arranged on points diametrically opposed to each other. An inductive displacement recorder comprising a ferromagnetic core secured to one of the platforms and a coil system secured to the other platform is arranged for telescoping movement with respect to each other. A clamp is mounted on each of the platforms and arranged for securement to a sample to be tensile tested so that the extensometer, which forms a cage construction, is concentrically secured to the sample to be tested.

3,696,513

THREE-PHASE GAUGING SYSTEM

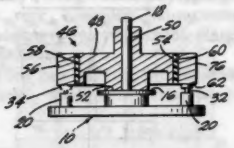
Francis G. Sullivan, Coldwater, Mich., assignor to Simpson Industries, Inc., Litchfield, Mich.

Filed March 19, 1970, Ser. No. 21,131

Int. Cl. G01b 7/24, 7/315, 19/295

U.S. Cl. 33—174 L **2 Claims**

A gauging system for determining the relative relationship of given locations on an item being gauged with respect to each other or a reference location utilizing multiple-phase alternating current, in particular three-phase alternating current, wherein the item being gauged is engaged at predetermined locations by electrical linear differential measuring devices each being energized by a separate phase of the alternating current supply, the output of the measuring devices being electrically interconnected and associated with electrical indicating means to give an electrical indication of the lo-



cation of the sensing components of the electrical measuring devices and, hence, give an electrical indication of the physical characteristics of the item being gauged. With three-phase alternating current three electrical linear measuring devices are angularly spaced at 120° intervals about the reference support member supporting the item being gauged, and the electrical sensing circuit may include phase indication means to indicate the location of the maximum deviation of the item being gauged with respect to a reference surface or point.

3,696,514

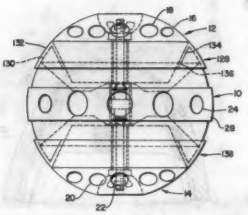
DEVICE FOR DETERMINING FINGER HOLE POSITIONS IN BOWLING BALLS

Hal Byers McIntyre, and Harvey Edward Hickey, both of Hopkinsville, Ky., assignors to SW Industries, Inc., Newton, Mass.

Filed Oct. 26, 1970, Ser. No. 83,932

Int. Cl. G11b 5/00

U.S. Cl. 33—174 F **7 Claims**



A ball-like device having a medial section and a pair of opposed cap sections. The medial section is formed with a sequence of holes designed to selectively fit the thumb of both right and left handed bowlers. One of the cap sections is provided with a sequence of holes in the form of pairs of smaller and larger holes that are designed to selectively fit the ring and middle fingers of right handed bowlers. The other cap section is provided with a sequence of holes in the form of pairs of smaller and larger holes that are designed to selectively fit the ring and middle fingers of left handed bowlers. Each cap section is pivotably mounted to the medial section in order to adjust the span between a selected ring and middle finger hole pair and a selected thumb hole.

3,696,515

PLEATING DEVICE

Michael E. Tuskos, 2507 Saratoga Drive, Louisville, Ky.

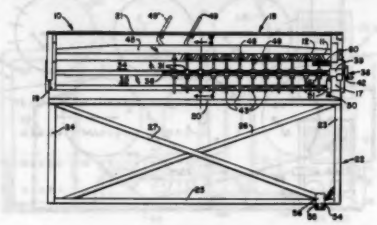
Filed July 12, 1971, Ser. No. 161,534

Int. Cl. B43l 9/08

U.S. Cl. 33—192 **10 Claims**

This invention provides an improved device for alloting material for pleats and spacing between those pleats in making

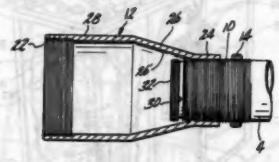
draperies and the like. Basically, it comprises first and second lazy-tong mechanisms, each having opposite first and second ends. The first mechanism has one of its ends fixed to a base member. Adjustable means are provided for interconnecting the second mechanism to the base member and for variably spacing it apart from the first mechanism. Indicator means are carried by the two mechanisms. These indicator means are adjustably positionable with respect to a sheet of material placed adjacent to the two mechanisms by movement of the adjustable means and of the first mechanism. In the presently preferred form of the present invention, the indicated spacing between the pleats is adjusted by movement of the adjustable means, while the indicated amount of material alloted for gathering into the pleats is adjusted by movement of the first mechanism.



3,696,516
SCOPE TUBE WITH OCULAR RETAINER RING

John F. Thompson, El Paso, Tex., assignor to W. R. Weaver Company

Filed March 23, 1971, Ser. No. 127,315
Int. Cl. F41g *1/38, 1/42*
U.S. Cl. 33—245 4 Claims

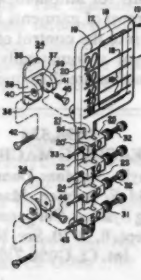


A retaining ring is snap-fitted onto a telescopic gunsight tube behind an ocular housing to prevent the ocular housing from being accidentally removed from the tube, thus nitrogen gas in the interior of the scope cannot be accidentally released therefrom.

3,696,517
RANGE FINDER AND BOW SIGHT DEVICE

Marlow W. Larson, 595 41st St., Ogden, Utah

Filed June 10, 1970, Ser. No. 45,189
Int. Cl. F41g *1/00*; F41b *5/00*
U.S. Cl. 33—265 2 Claims

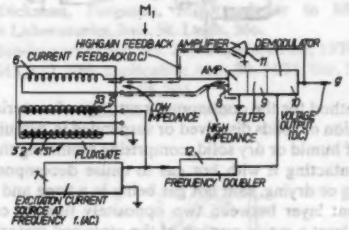


A range finder and bow sight device wherein plural sights are made adjustable and correlated with a fixed, stepped range finder. The individual bow sights used are adjustable both for height and azimuth, and in a preferred form of the invention, can be locked through such adjustment to a vertical slide member. Mounts on the device are self-aligning and can be screwed or taped to a conventional archery bow.

3,696,518
VEHICLE DIRECTION SENSING AND STEERING SYSTEMS USING MAGNETIC FLUX RESPONSIVE MEANS

Andrew Francis Vincent Lest, Ann Arbor, Mich., assignor to Elliott Brothers (London) Limited, London, England

Division of Ser. No. 683,641, Nov. 16, 1967, abandoned. This application June 15, 1970, Ser. No. 46,385
Claims priority, application Great Britain, Nov. 19, 1966, 51,889/66
Int. Cl. G01c *17/38*
U.S. Cl. 33—357 5 Claims

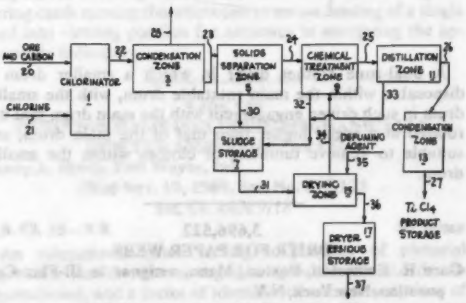


A fluxgate magnetometer circuit is described using a null method of indicating the magnitude and phase of a predetermined component of magnetic field lying along its axis. A correction circuit corrects the output of the fluxgate magnetometer circuit for (i) errors resulting from extraneous magnetic fields which detract from or augment a component of magnetic flux being measured, and (ii) errors due to distortion of the predetermined component of flux by the proximity of magnetizable materials.

3,696,519
TREATMENT OF TITANIUM TETRACHLORIDE DRYER RESIDUE

William C. Pefferman, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed April 1, 1971, Ser. No. 130,331
Int. Cl. C01g *23/00*
U.S. Cl. 34—9 5 Claims

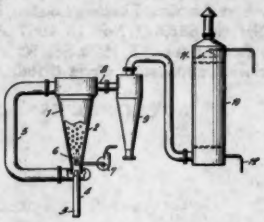


The production of titanium tetrachloride by chlorination of titaniferous ores is described. Fuming of titanium tetrachloride dryer residue is inhibited by adding alkali and/or alkaline earth metal carbonates to the dryer means before exposing the residue to air.

3,696,520
PROCESS AND DEVICE FOR THE TREATMENT OF MATERIAL

Peter Klaus Niedner, 8000 Munich 19, Sudliche Auffahrstallee 70, and Gerhard H. Diez, 8000 Munich 81, Freischutzstrasse 110/1308, both of Germany, assignors to said Niedner, by said Diez

Continuation-in-part of Ser. No. 522,918, Jan. 25, 1966, abandoned. This application Jan. 6, 1970, Ser. No. 975
Int. Cl. F26b *3/08*; F27b *15/10*
U.S. Cl. 34—10 5 Claims

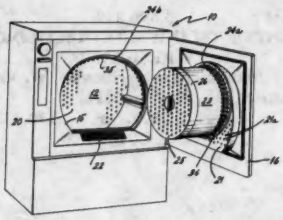


A method for the continuous treatment of material, namely separation of solids dissolved or suspended in a liquid or treatment of humid or dry solid, comprising atomizing the material and contacting it with hot gas to cause decomposition, calcinating or drying, said hot gas being in a zone and forming a turbulent layer between two oppositely flowing currents of gas, at least a major portion of the atomized material passing through the turbulent layer, and a portion of the gas containing the material being withdrawn.

3,696,521
LAUNDRY DRYER

James R. Hubbard, Moorestown, N.J., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Dec. 24, 1970, Ser. No. 101,308
Int. Cl. F26b *11/02*
U.S. Cl. 34—128 7 Claims



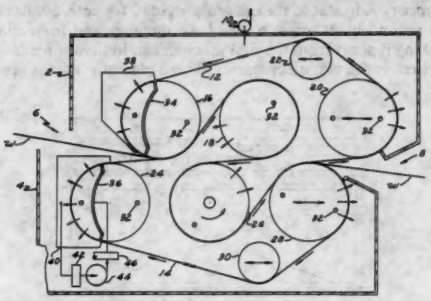
A dual-zone clothes dryer in which a smaller drum is disposable within the main rotatable drum, with the smaller drum in such driven engagement with the main drum that it is rotated at a speed higher than that of the main drum, and suitable to achieve tumbling of clothes within the smaller drum.

3,696,522
DRIER FOR PAPER WEBS

Garo H. Krikorian, Paxton, Mass., assignor to Hi-Flux Corporation, New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,346
Int. Cl. F26g *11/02*
U.S. Cl. 34—115 7 Claims

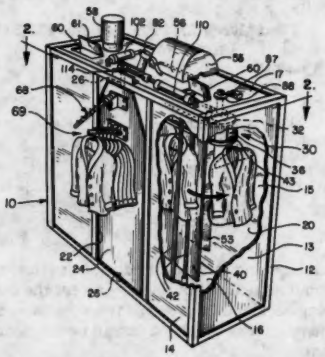
Apparatus for continuously drying a web of paper sheet material having a pair of foraminous, thermally conductive, endless conveyor belts supported to receive a web therebetween and carry the same under tension around at least two closely spaced heater rolls, each roll in turn reversing the direction of travel of the belts and in contact therewith for greater than 180° of its cylindrical surface, thus providing adjacent zones of concentrated heat exchange in a dimensionally compact high speed drying operation. Blow-through heating rolls guide the belts at the web inlet and outlet for preheating each belt in advance of web contact therewith.



3,696,523
STEAM AIR GARMENT FINISHER

Michael G. Beeley, North Salt Lake City, and Richard D. Thompson, Salt Lake City, both of Utah, assignors to McGraw-Edison Company, Elgin, Ill.

Filed May 3, 1971, Ser. No. 139,458
Int. Cl. F23b *19/00*
U.S. Cl. 34—216 16 Claims



A batch box steam air finisher having the operating advantages of typical batch box finishers while yet further having the operating advantages of typically high cost tunnel-type finishers. This disclosed finisher has an enclosure with an internal completely confined conveyor for carrying garments in single file individually past specific conditioning discharge means and specific air whip drying means, and also has additional conveyor means for automatically loading and/or unloading a batch or group of garments into or from the enclosure and specifically into the control of or from the control of the confined conveyor automatically, whereby a common finishing cycle can finish more than one garment.

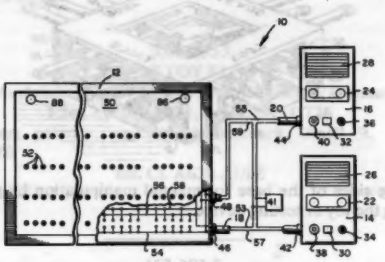
3,696,524
TEACHING MACHINE

Robert Donald Kranyik, Weston; Donald E. Vegliante, North Haven, and Donald F. Balmer, Madison, all of Conn., assignors to Learning Systems Corporation, Hamden, Conn.

Filed Sept. 8, 1970, Ser. No. 70,210
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 C 16 Claims

A teaching machine which utilizes both oral and graphic information to test a student's ability. Graphic representation on

an activity sheet mounted to an activity board are identified by a student in response to questions posed to the student through a tape recorder. The student responds to the questions by inserting a probe through the activity sheet into



the activity board which produces a response commensurate with the correctness of the answer given by the student. Both remedial response in the event of a wrong answer and reinforcing response in the case of a correct answer may be provided.

3,696,525

TOUCH DETECTING TEACHING MACHINE

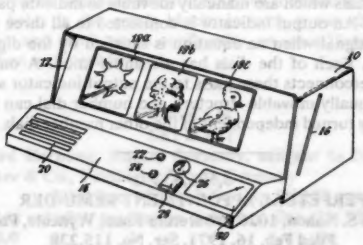
Alan Cleary, 7 and 8 Sydenham Terrace, Newcastle upon Tyne, England

Filed Nov. 2, 1970, Ser. No. 86,173

Claims priority, application Great Britain, Nov. 13, 1969, 55,602/69

Int. Cl. G09b 7/06

U.S. Cl. 35—9 B **9 Claims**



A touch detecting teaching machine for teaching young children or those with sub-normal intelligence. The machine is a desk model having three display panels on which symbolic visual information can be presented by means of a card which s fed into the machine. The machine asks the subject a question about the visual information displayed and invites him to select the correct alternative. The subject gives his answer by touching the appropriate panel and the machine responds if he has answered correctly.

3,696,526

EDUCATIONAL TESTING AND INSTRUCTIONAL DEVICE

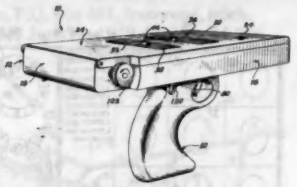
Harold H. Roeder, and Marcia A. Roeder, both of R.D. W. Lake Road, Dunkird, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,516

Int. Cl. G09b 3/00

U.S. Cl. 35—9 E **9 Claims**

A device for use in the instructor-testing and self-instruction of students consisting of a pre-programmed tape carried within a permanently sealed cassette and means manipulatable by the instructor and/or student for a step-wise driving of



the tape relative to a pair of alternatively closeable view openings through which a tape carried indicia is to be viewed.

3,696,527

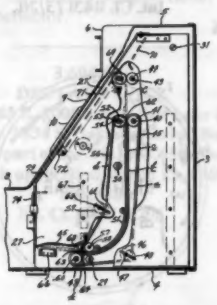
CARD FEEDER FOR INSTRUCTIONAL DEVICES

John J. Dickman, Ferguson, Mo., assignor to Missouri Research Laboratories, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 21,804, March 23, 1970, Pat. No. 3,645,012. This application Aug. 30, 1971, Ser. No. 176,205

Int. Cl. G09b 3/00

U.S. Cl. 35—9 R **6 Claims**



A card feeder for instructional devices, such as teaching machines, wherein a card, the forward face of which, having inscribed question and multiple choice answers, is presented to the viewer and with the rearward face being suitably adapted for cooperating with a photoemissive source to effect requisite energization of indicators for signaling the correctness or incorrectness of the answer chosen; said feeder incorporating normally mutually contacting drive and driven belts adapted for effecting separation of inadvertently mutually adhering cards moving therebetween to assure feeding of a single card into viewing position for accuracy in energizing the appropriate indicators.

3,696,528

QUESTION GAME INCLUDING MECHANICALLY INDEXED ANSWER APPARATUS

Henry A. Mertz, Fort Wayne, Ind.

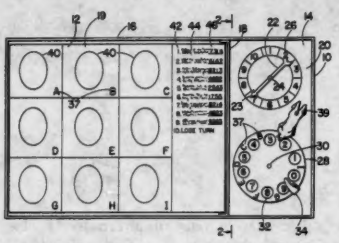
Filed Nov. 10, 1969, Ser. No. 875,125

Int. Cl. A63f 9/18

U.S. Cl. 35—9 R **5 Claims**

An educational game having a plurality of pictorial representations thereon arranged in a predetermined order on a gameboard, and a series of identifications or descriptions of the representations arranged on the gameboard in an order different from the order of the pictorial representations. Associated with each of the identifications or descriptions is a multi-digit number. A telephone-dial-like device is provided. The game is played by picking one of the identifications or descriptions, guessing which representation relates to it, dialing the multi-digit number associated with the identification or

representation picked, the completion of which will indicate which pictorial representation is associated with that identification or description. A point is scored if the correct pictorial representation was guessed.



3,696,529

DRAWING AND TEACHING MACHINE

David Robert Mabbutt, London, England, assignor to Rotadraw Limited, London, England

Filed Feb. 11, 1971, Ser. No. 114,418

Claims priority, application Great Britain, April 30, 1970, 20,847/70

Int. Cl. B43l *13/20*

U.S. Cl. 35—26 4 Claims

A drawing or teaching apparatus for drawing an object including a circular disc having a reference mark and a plurality of apertures and/or slots hereafter referred to as apertures, each aperture having an alphabetical letter associated therewith, these alphabetical letters together forming the name of the object, and a frame having a recess or aperture adapted to receive the disc so that the disc can rotate therein, the frame having at least a plurality of stationary alphabetical letters corresponding to the first said alphabetical letters located at different positions around the periphery of the recess or aperture in the frame so that by rotating the disc in the frame successively into angular positions where the reference mark is adjacent each of the stationary alphabetical letters on the frame which correspond to an alphabetical letter associated with an aperture in the disc and tracing along the contour of the corresponding aperture, a representation of the object is drawn.

3,696,530

EDUCATIONAL TOY

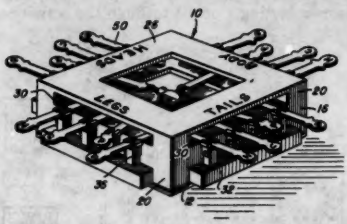
Clifford F. Bryant, Struthers, Ohio, assignor to Albert White, Cadiz, Ohio, a part interest

Filed April 14, 1971, Ser. No. 133,904

Int. Cl. G09b *1/14*

U.S. Cl. 35—28 9 Claims

A toy and educational device as well as a testing apparatus including a multi-sided base having a central platform area upon which a selected figure representation to be duplicated may be placed and with sets of individual fragmentary figure components supported from the inner ends of wands shiftably supported from the base and having their inner ends adjacent the central platform and their outer ends projecting outwardly of the sides of the base for manual manipulation by persons using the toy or testing device.



3,696,531

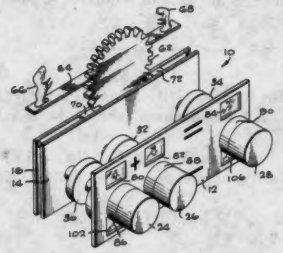
EQUATION APPARATUS

Larry C. Stewart, 7104 Jordan Ave., Apt. 4, Canoga Park, Calif.

Filed May 17, 1971, Ser. No. 143,913

Int. Cl. G09b *19/02*

U.S. Cl. 35—31 A 26 Claims



Equation apparatus has at least first, second, and third number dials which are manually movable to indicate particular digits. An output indicator is connected to all three of the dials, to signal when an equation is satisfied by the digits on the dials. Each of the dials has a manual knob. A one-way drive interconnects these parts to the output indicator so that each manually movable structure and number dial can be individually turned independent of the other number dials.

3,696,532

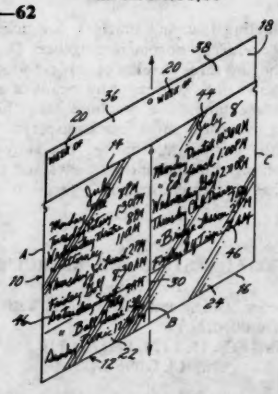
PERPETUAL APPOINTMENT REMINDER

Abraham S. Nahon, 1026 Arboretum Road, Wyncote, Pa.

Filed Feb. 16, 1971, Ser. No. 115,238

Int. Cl. B43l *1/00*

U.S. Cl. 35—62 6 Claims



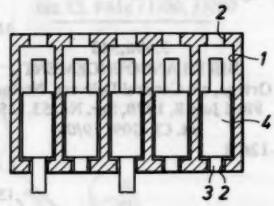
A perpetual memo pad including a transparent sleeve formed of hinged sections and adapted to receive erasible in-

dicia, and a card bearing permanent indicia and insertable into said transparent sleeve in a manner to align selected indicia on said transparent sleeve with selected indicia on said card, said sleeve being rotatable relative to said card to bring other selected indicia on the sleeve into alignment with other selected indicia.

3,696,533
SET OF TOY BLOCKS

Hans Mortensen, Ringerbakken 39, 2830 Virum, Denmark

Filed April 6, 1971, Ser. No. 131,726
Claims priority, application Denmark, April 9, 1970, 1792/70
Int. Cl. A63h *33/08*
U.S. Cl. 35—70 **5 Claims**

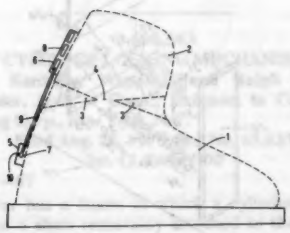


A set of toy blocks for performing various arithmetical processes, particularly for children, comprising calculating or problem blocks, which visibly represent arithmetical problems, e.g. problems of addition or multiplication, or the individual quantities constituting the said problems, and result blocks which visibly represent the corresponding results and which are arranged for being composed with the problem blocks. The problem blocks are designed with through channels which are located in exactly the same place in all problem blocks. In the channels piston bodies are accommodated which can be displaced longitudinally by interaction with pins on or holes in the result blocks in such a way that when problem and result are in conformity, an assemblage with an unbroken surface is formed.

3,696,534
SKI BOOT

Gerhard Hornung, Singen, Germany, assignor to Dr. Justus Rieker & Co., Tuttlingen, Wurtt, Germany

Filed Dec. 17, 1970, Ser. No. 99,102
Claims priority, application Germany, Dec. 23, 1969, P 19 64 370.0
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **17 Claims**

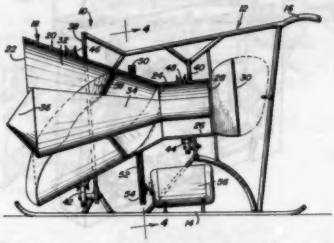


A skiboot with relatively bendable foot and neck portions, with a lug on each portion, a coupling element between the lugs, and two stops to limit the bending movement. Buffers are provided on the stops to damp the relative bending movement at its limits.

3,696,535
SNOW DISPLACING DEVICE WITH ROTATABLE BLADE CASING

Oliver C. Kallio, P.O. Box 401, Ironwood, Mich.

Filed June 12, 1970, Ser. No. 45,786
Int. Cl. F01h *5/09*
U.S. Cl. 37—43 C **4 Claims**

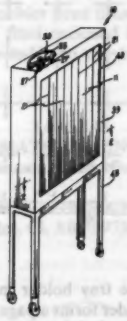


A snow conveying vehicle mounting a conical member rotatable about a forwardly inclined horizontal axis. Helical vanes are internally secured to the conical member about a conical fairing to form an annular conveyor flow passage for the snow. Snow entering the larger inlet end is displaced rearwardly in response to rotation of the conical member and is discharged rearwardly from a smaller outlet end against a laterally directing deflector.

3,696,536
DISPLAY DEVICE

Frank P. Reese, 2785 E. 7000 South, Salt Lake City, Utah, and LeRoy D. Yancey, 1834 S. Oakmont Drive, Bountiful, Utah

Continuation-in-part of Ser. No. 603,658, Dec. 21, 1966, abandoned. This application March 12, 1969, Ser. No. 806,588
Int. Cl. G09f *11/06*
U.S. Cl. 40—35 **16 Claims**



A display device is provided which includes a plurality of display panels arranged side-by-side in a series and means for capturing a panel at one end of the series and moving it in a positively controlled manner to a position at the opposite end of the series.

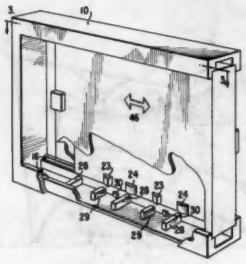
3,696,537
SKIP FRAME VISUAL DISPLAY DEVICE

Ronald D. Alleman, 526th Maint Co., APO, San Francisco, Calif.

Filed Nov. 4, 1969, Ser. No. 873,921
Int. Cl. G09f *11/30*
U.S. Cl. 40—78.07 **11 Claims**

A viewing device in which successive cards of a series are removed from one end of a stack or supply and deposited at

the end of the same or another stack or supply and a transfer mechanism for indexing such cards one at a time such that on every other transfer or given number of transfers, the illustration shown, respectively, by any two or corresponding given

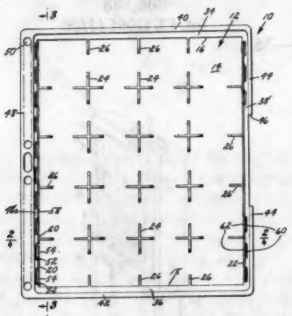


number of adjacent stacks is completely changed. The cards are peculiarly constructed to cooperate with the transfer mechanism and to maintain the correct sequence of such cards within the stacks.

3,696,538
TRANSPARENCY HOLDER

Robert Nast, 942 Glenridge Ave., North Woodmere, Long Island, N.Y.

Filed June 22, 1970, Ser. No. 48,319
Int. Cl. G09f *13/10*
U.S. Cl. 40—104.18 **9 Claims**



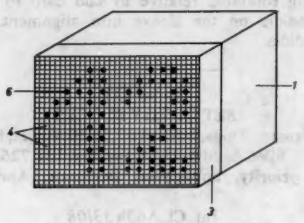
A photographic slide tray holder including a plurality of compartments. The holder forms a page which with other such pages is mounted in a book. More than one slide may be held in each tray compartment, and the transparency of a fitted cover permits easy viewing of the contents held therein. The cover is separate from the tray and may be removed therefrom. A rib or edge male member attached to the cover portion is snap-fitted into a trough or female member of the tray portion to form a hinge means therewith.

3,696,539
VISUAL INFORMATION APPARATUS

Lorenz Hanewinkel, Ferrariweg 17a, Paderborn, Germany

Filed Nov. 7, 1969, Ser. No. 870,537
Claims priority, application Germany, Aug. 17, 1971, P 18 06 573.1
Int. Cl. G09f *1/00*
U.S. Cl. 40—125 E **4 Claims**

A visual information apparatus comprising a housing and a panel on which appear the insignia formed in the housing. A

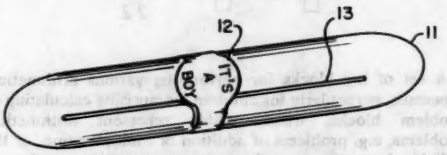


screen divided into squares is fitted over the panels and the insignia may be sighted on the screen.

3,696,540
BIRTH ANNOUNCEMENT

Charlotte C. Ortega, c/o General Delivery, Nestor, Calif.

Filed July 8, 1970, Ser. No. 53,135
Int. Cl. G09f *19/00*
U.S. Cl. 40—126 R **1 Claim**

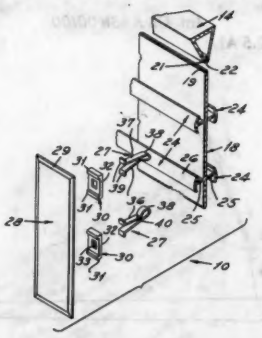


A birth announcement rolled to fit within a hollow simulated cigar having, in one embodiment, a slot for pulling the birth announcement out, the birth announcement being attached to a simulated cigar band and, in another embodiment, the simulated cigar having two halves, one slidably receiving the other.

3,696,541
DISPLAY SIGN

Phillip D. Pittman, Sterling Height, and Michael L. Peters, Mt. Clemens, both of Mich., assignors to Endura Board International, Inc., Sterling Heights, Mich.

Filed Feb. 16, 1971, Ser. No. 115,186
Int. Cl. G09f 7/02
U.S. Cl. 40—142 **18 Claims**



The sign has an upright planar supporting panel unit carrying like integrally extended, horizontally elongated supporting brackets on opposite side surfaces thereof, each of which presents upwardly and downwardly opening clip support recesses. These receive arcuate nose portions of double-

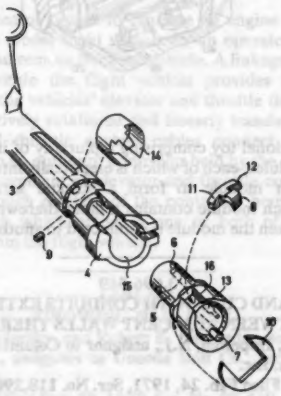
armed spring metal clips by which sign indicia are removably supported on the panel. The spring arms terminate outwardly in oppositely directed locking fingers, and after compressive flexure of the spring arms toward and flatwise against one another from an approximately 90° relaxed relationship, their fingers are inserted into a bayonet-type keeper slot of a clip holder part on the rear of a sign indicium member, whereupon the arms are released from compression and spread to interlock their fingers with the indicium's keeper slot.

3,696,542

BREECH BLOCK WITH RIM FIRE STRIKER

Axel E. Ekfeldt, Tullgatan 2, 632 20 Eskilstuna, and Eric W. Wallberg, Enspannargatan, 8, 162 33 Vallingby, both of Sweden

Filed July 17, 1970, Ser. No. 55,861
Int. Cl. F41c *11/00, 15/00*
U.S. Cl. 42—16 **2 Claims**



A standard rifle mechanism of the Mauser type having means which converts it to rim fire operation, the breech block having locking means for guiding and locking it to a body which includes a barrel. The breech block has a plug-in head in its forward end and said head has an eccentrically-located firing pin and said head is provided with a hole for a spring-actuated ejector pin. A clip has ends abutting against parts of a yoke that is formed with an extractor tooth, the yoke and its tooth being counter-sunk in the plug-in head and the tooth is arranged to grip the rim of a cartridge that is introduced in a seat in the barrel, the extractor and a locking pin being effective to keep the head in its proper place, the extractor and pin being in turn kept in their positions by a counter-sunk spring clip that extends around the jacket wall of the breech block.

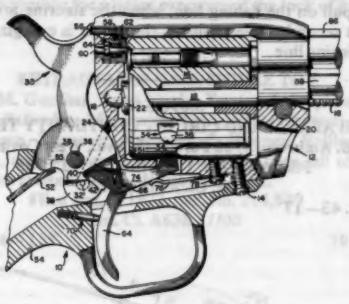
3,696,543

CYLINDER LOCKING MECHANISM

Ralph C. Kennedy, Wapping, and Ralph R. Torning, Manchester, both of Conn., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,637
Int. Cl. F42c *1/00*
U.S. Cl. 42—67 **5 Claims**

A revolver has a frame in which a cylinder is rotatably mounted on a shaft removably attached to the frame. The cylinder has ratchet teeth provided at one end of the cylinder. A pawl mounted within the frame is adapted to engage the ratchet teeth to turn the cylinder from one firing position to another firing position. The pawl is connected to a hammer by means of a pin. A plurality of locking notches are disposed around the periphery of the cylinder such that a notch is provided for each cartridge position. Each notch has a sloping entrance cut for progressive entrance of a cylinder lock. The cylinder lock includes an elongated aperture which is mounted on a trigger pin such that rotation of the hammer



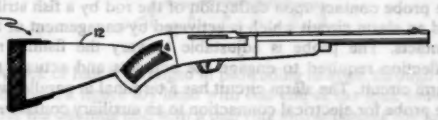
from the firing position to the cocked position unlocks and then locks the cylinder. A leaf spring secured to the frame contacts the lock for urging it into engagement with a locking notch.

3,696,544

RECOIL PAD

George Webb, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed Aug. 17, 1970, Ser. No. 64,235
Int. Cl. F41c *23/00*
U.S. Cl. 42—74 **2 Claims**



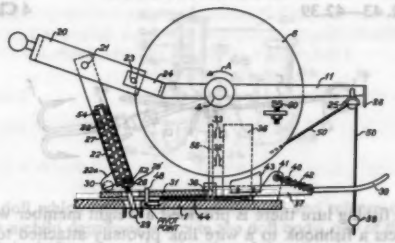
A recoil pad for shoulder fired firearms comprises an open cellular material and fluid enclosed in a flexible container. The container is attachable to the butt end of the firearm stock.

3,696,545

AUTOMATIC FISHING REEL

Elldi Norddahl Gudjonsson, Lindarflot 37, Gardahreppi, Iceland

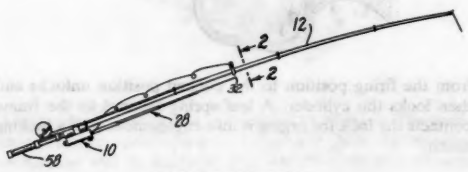
Filed June 1, 1970, Ser. No. 41,957
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **12 Claims**



The automatic motor driven fishing reel having a lever pivotally mounted on a motor driven shaft, the lever also supporting a fishing line as it is reeled off the reel member. A steering arm is pivotally attached to the lever and a spring member is pivotally attached to the steering arm which is movable to first and second stable positions. A clutch is pro-

vided between the motor and reel member which is disengaged when the steering arm is in its first stable position and which is engaged when the steering arm is in its second stable position to interconnect the reel and motor. Upon a predetermined pull on the fishing line, when the steering arm is near, or in its second stable position, the motor is energized to reel in the fishing line.

3,696,546
FISH ALARM AND CIRCUIT CONTINUITY TESTER
Henry B. Ambrose, 3722 Forecastle Ave., West Covina, Calif.
Filed March 8, 1971, Ser. No. 121,745
Int. Cl. A01k 97/12
U.S. Cl. 43—17 **11 Claims**

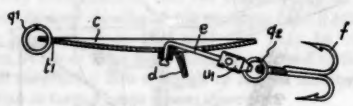


An alarm device adapted for use as a circuit continuity tester and a fish strike alarm for attachment to a flexible fishing rod. The alarm device has a battery housing with means for attaching the housing to a fishing rod, a probe extending from the housing having an electrical contact at its outer end, a clamp to be attached to the fishing rod opposite the outer probe end and having an electrical contact engageable with the probe contact upon deflection of the rod by a fish strike, and an alarm circuit which is activated by engagement of the contacts. The probe is adjustable to vary the fishing rod deflection required to engage the contacts and actuate the alarm circuit. The alarm circuit has a terminal in parallel with the probe for electrical connection to an auxiliary contact element, such as a second clamp, to adapt the alarm device for use as a circuit continuity tester.

ERRATUM

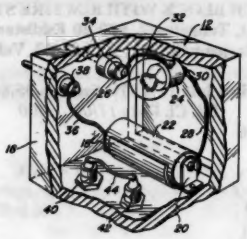
For Class 43—15; see:
Patent No. 3,696,545

3,696,547
FISHING LURE
Roger Daniel Cauquis, 25 rue de la Prairie, Aulnay Sous Bois, France
Filed Feb. 19, 1971, Ser. No. 116,830
Claims priority, application France, Feb. 19, 1970, 7005958
Int. Cl. A01k 85/00, 91/04
U.S. Cl. 43—42.39 **4 Claims**



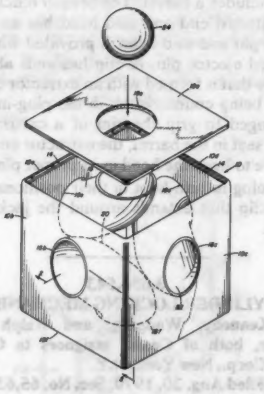
In a fishing lure there is provided a weight member which connects a fishhook to a wire link pivotally attached to the lure body. The weight member has a plurality of bores extending at right angles to one another. One bore contains the end portion of the wire link, at least one bore receives a flattened, laterally expanding portion of said wire link for anchoring the latter to the weight member and one bore serves for the introduction of a punch causing a localized flattening of said wire link.

3,696,548
EDUCATIONAL BUILDING TOY MODULES WITH INTERIOR LIGHTS AND MECHANICAL CONNECTIONS ACTING AS CIRCUIT CLOSERS
Alvin N. Teller, Chicago, Ill., assignor to Kinetic Technologies, Inc.
Filed Jan. 18, 1971, Ser. No. 107,191
Int. Cl. A63h 33/08
U.S. Cl. 46—25 **3 Claims**



An educational toy comprising a plurality of interiorly illuminable modules, each of which is electrically interengageable with another module to form a stacked arrangement of modules. Each module contains a lamp therewithin which is energized when the module is connected to another module.

3,696,549
BALL AND CUBE WITH CONDUITS EXTENDING BETWEEN ADJACENT WALLS THEREOF
Tadas Zilius, Hopewell, N.J., assignor to Columbia Broadcasting System, Inc.
Filed Feb. 24, 1971, Ser. No. 118,290
Int. Cl. A63h 33/00
U.S. Cl. 46—43 **7 Claims**



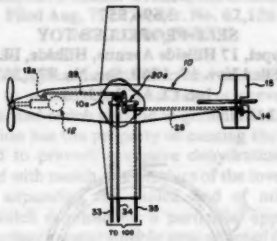
An amusement device employing a hollow cubical box having three curved conduit members assembled therein, each extending from and between a central opening in one wall of the box and a central opening in an adjacent wall, the conduit members forming passageways for a ball. No matter which side is up, a ball dropped in the top opening comes out a side one, but a ball inserted in one of the side holes disappears within the box.

3,696,550

FLIGHT CONTROL SYSTEM

Harold M. Troxell, 292 Gledwood Ave., Burlington, N.J.

Filed Feb. 5, 1971, Ser. No. 112,909
Int. Cl. A63h 27/04
U.S. Cl. 46—77 10 Claims



A flight control system to regulate an engine throttle and elevator of a model flight vehicle by an operator positioned external to and remote from the vehicle. A linkage mechanism positioned within the flight vehicle provides independent operation of the vehicles' elevator and throttle through a plurality of relatively rotational and linearly translatable levers. Elevator and throttle control cables connect the linkage mechanism to an outboard controller held by the operator. Independent movement of elevator and throttle control rods is achieved through rotation of the controller housing about a particular axis which activates one or both of the control members within the flight vehicle.

3,696,551

GROWING-HAIR DOLL

Bernard B. Sklarsky, and Robert K. Ostrander, both of Woodmere, N.Y., assignors to Uneeda Doll Co., Inc., Brooklyn, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,449
Int. Cl. A63h 11/00
U.S. Cl. 46—135 6 Claims

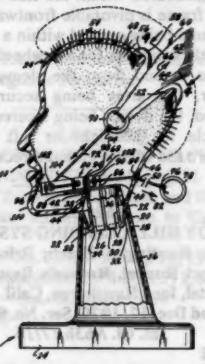
A miniature doll having a lock of hair which can be readily adjusted to vary the exposed length thereof to vary the appearance of the doll. The head of the doll is hollow and is provided at its top with a keyhole-shaped opening having a narrow slotted portion contiguous with a larger circularly shaped portion. The body of the doll has a hollow portion and at least one leg of the doll is hollow. The hollow portions of the leg, body and head are aligned and enclose a resilient member which is affixed at one end to the bottom of the leg. The adjustable lock of hair is attached to the other end of the resilient member adjacent to an annular key or wedge which is supported on the resilient member. A child may readily pull the lock of hair and position the key in the slotted portion of the keyhole-shaped opening to provide for a greater length of exposed lock of hair. In this position of the key, the resilient member is stretched and urges the key against the top of the head adjacent the slotted portion. To shorten the exposed length of the lock of hair, the lock is lifted away from the head and moved over the circular portion of the opening. When the lock is thereafter released, the key is drawn into the circular portion of the keyhole opening by the resilient member so that part of the lock of hair also is drawn into the hollow head of the doll to provide for a lesser exposure of the lock of hair.

3,696,552

RETRACTABLE HAIR FIGURE TOY

Gregory M. Gunther, Palos Verdes Estates; J. Stephen Lewis, Pacific Palisades; Masakatsu Nishiguchi, Gardena; George E. Robson, Torrance; Raymond P. Wagner, Rollings Hills Estates, and William R. Yarbrough, Cerritos, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 3, 1972, Ser. No. 214,939
Int. Cl. A63h 11/00
U.S. Cl. 46—135 10 Claims



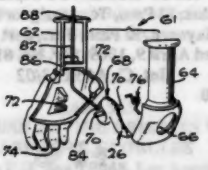
A lock of hair is arranged in protruding relation through an opening in a figure toy head with one end of the lock rooted about the opening and with a pull ring encompassing the lock inside the head intermediate the ends of the lock. A pull cord is connected to the ring and may be mechanically pulled to retract the lock after the lock has been manually pulled from the head. A friction clip engages the pull cord to impact drag to the cord.

3,696,553

OBJECT-HOLDING HANDS FOR DOLLS

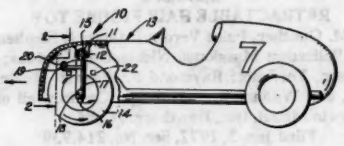
J. Stephen Lewis, Pacific Palisades; Jurgis Sapkus, Manhattan Beach, and Armando P. Villasana, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed July 16, 1971, Ser. No. 163,202
Int. Cl. A63h 13/00
U.S. Cl. 46—116 3 Claims



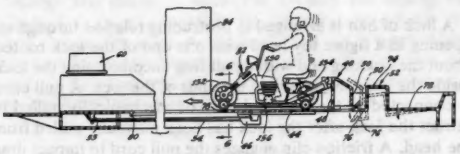
A doll which can be operated to hold and release objects when a child depresses levers in the doll body, one of the doll hands including a grasping thumb and the other having a magnet that can slide therein to magnetically attract and release objects. The doll is especially entertaining when used with accessories of the type found in a supermarket, one accessory being a price tag constructed of magnetically attractable material and attached to a toy package, to enable the doll to magnetically hold and release the package.

3,696,554
STEERING MECHANISM FOR TOY VEHICLES
Jerome Dorn, 1826 Borland Road, Pittsburgh, Pa.
Filed Aug. 20, 1970, Ser. No. 65,613
Int. Cl. A63h *11/10*
U.S. Cl. 46—201 **5 Claims**



A steering device for toy hand vehicles which will eliminate the need for a steering wheel. This device includes a horizontal shaft which is secured within the side walls of the vehicle and a U-shaped frame is pivotable frontwards and rearwards, the U-shaped frame being carried within a pair of sleeves having projecting axle members for the wheels of the toy. A pair of steering arms extend from the sleeves carrying the U-shaped member, the arms being secured together by a horizontal tie rod, the device being steered by applying force upon the vehicle to the right or left which causes the mechanism to turn the wheels in that direction.

3,696,555
TOY HILL-CLIMBING SYSTEM
Joseph H. Bales, Huntington Beach; Brian S. Prodger, Torrance, and Kurt Ruppel, Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 17, 1970, Ser. No. 99,084
Int. Cl. A63h *17/16*
U.S. Cl. 46—202 **10 Claims**



A toy hill-climbing system is disclosed including a simulated motorcycle, a motorcycle launcher, a roadway simulating rough terrain and parallel tracks connecting the roadway and the launcher. The roadway is placed at a greater vertical height than the launcher so that the tracks are upwardly sloped to simulate an actual motorcycle hill climb competition.

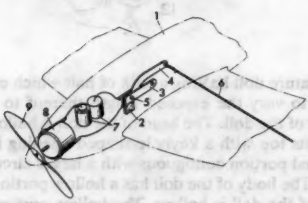
3,696,556
HOOP-ROLLING PUSHER
Chesteen S. Plasket, El Paso, Tex., assignor to Earl L. Chamber and Donald Maynard, El Paso, Tex., part interest to each
Filed April 9, 1969, Ser. No. 814,543
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 **1 Claim**

A pusher for use in rolling a hoop wherein a length of rod or wire is bent at one end to form a loop which receives the forward end of the hoop to push it and is bent at its other end to form a second loop which receives a circumferentially disposed portion of the hoop to guide the hoop while it is being propelled. The second loop normally is maintained closed by means of a hook which is biased into engagement with an adjacent portion of the wire.

3,696,557
SELF-PROPELLED TOY
Reinhold Ruppel, 17 Hillside Avenue, Hillside, Ill.
Filed Nov. 17, 1969, Ser. No. 877,387
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 M **5 Claims**

A self-propelled toy includes a hollow shell and a motive means which includes a battery-operated motor, enclosed within the shell for causing the shell to roll along a supporting surface. A gravity-operated switch is mounted on the motive means for de-energizing the motor when the toy is not in use. In operation, the motive means is disposed at a lowermost portion of the shell, and the switch is disposed in a position to energize the motive means for causing the shell to revolve about the motive means. When the shell becomes restrained from movement, the motive means moves relative to the shell along the inner surface thereof until the switch reaches a position where it opens the circuit to the motor.

3,696,558
STARTING SWITCH STRUCTURE IN A MODEL PLANE
Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1971, Ser. No. 205,501
Claims priority, application Japan, Dec. 7, 1970, 45/121028; Dec. 7, 1970, 45/121030; Dec. 7, 1970, 45/121029
Int. Cl. A63h *27/00, 33/26*
U.S. Cl. 46—243 AV **4 Claims**



A starting switch structure comprising a pair of fixed and movable contact plates adapted to be brought into contact with each other by pulling a control wire, a miniature electric motor for rotating a propeller and a dry cell all of which are mounted on the plane electrically connected to form an electric circuit. Such starting switch structure enables the model plane to be started by a single operator without an aid of an assistant by simply pulling the control wire from the distance. It weighs light, ensures a long period of life, and is simply constructed and manufactured at a low cost.

ERRATUM

For Class 46—77; see:
Patent No. 3,696,822

3,696,559

AGRICULTURAL PRODUCT AND PROCESS

John H. Hatton, 5275 Craner Avenue, North Hollywood, Calif.

Filed Aug. 7, 1970, Ser. No. 62,136
Int. Cl. A01g 7/00
U.S. Cl. 47—9 **1 Claim**

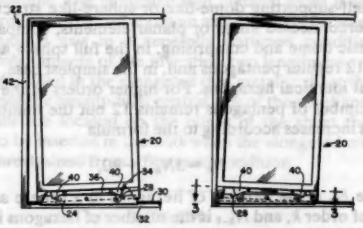
An improved agricultural product and process are provided which serve to stabilize soil and help to prevent wind and water erosion, and which also aid in germination. The product of the invention has the property of causing the soil to retain moisture and to prevent excessive dehydration of the soil. When applied with mulch, the product of the invention has the property of expanding the mulch and of minimizing the amount of mulch required for a particular application. The product comprises a water soluble gum selected from a certain group, as will be described.

3,696,560

ADJUSTABLE ALIGNING APPARATUS FOR MOVABLE PANELS

Peter R. Hallin, McComb, Miss., assignor to Craft Metals, Inc., McComb, Miss.

Filed Nov. 19, 1970, Ser. No. 91,047
Int. Cl. E05d 13/02, 15/08, 17/00
U.S. Cl. 49—425 **8 Claims**



A movable panel supported in a frame for horizontal travel, said panel mounting a movable structure for limited horizontal movement therein and defining horizontally spaced and oppositely inclined planes, and an insert rigidly mounted in said panel and defining plane engaging surfaces adapted to engage said planes for relative movement equally up and down proportional to the relative horizontal movement of said movable structure and the fixed insert.

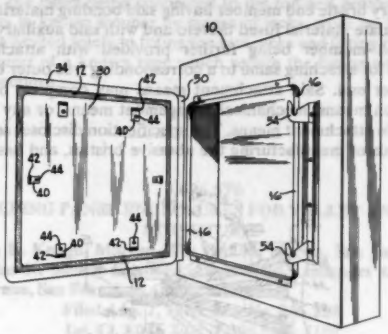
3,696,561

BIOLOGICAL DOOR SEAL

Richard D. Harp, Myersville, and Lyle G. Williams, Frederick, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed April 1, 1971, Ser. No. 130,116
Int. Cl. E06b 7/16
U.S. Cl. 49—483 **4 Claims**

A reliable leak-proof biological door seal for use with cabinets containing highly infectious materials therein. The door is provided with a beaded resilient membrane which is stretched over a continuous U-shaped frame section describing the near peripheral portions of each side of the inside of the door which is contacted by mating seating flange integral



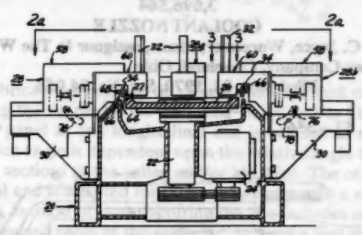
the cabinet proper for maintaining the cabinet absolutely tight under positive or negative pressures.

3,696,562

AUTOMATIC PROFILE GRINDING MACHINE WITH AN INDEXING MECHANISM

Oscar Schnellman, Zurich, Switzerland, and Henry Willy Stier, Dearborn Heights, Mich., assignors to Carmet Company, Pittsburgh, Pa.

Division of Ser. No. 751,879, Aug. 12, 1968, Pat. No. 3,587,192. This application April 28, 1971, Ser. No. 138,165
Int. Cl. B24b 49/04
U.S. Cl. 51—165.88 **5 Claims**



An automatic profile grinding machine with indexing mechanism especially for contour grinding of relatively small parts such as tool inserts, comprised of a grinding wheel, work stations arranged around said grinding wheel, universal work feeding mechanism associated with each work station, individual cam mechanisms for each work station to index the grinding steps, electric and fluid pressure control mechanisms to control operation of the machine, work measuring mechanism and adjusting mechanism associated with the measuring mechanism to compensate for wear or out of balance condition of the grinding wheel.

3,696,563

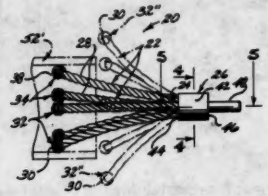
ABRASIVE BRUSH HAVING BRISTLES WITH FUSED ABRASIVE GLOBULES

Steve A. Rands, c/o P.O. Box 18948, Los Angeles, Calif.

Filed Oct. 13, 1969, Ser. No. 870,486
Int. Cl. B24b 9/02
U.S. Cl. 51—332 **10 Claims**

The specification discloses an article of manufacture comprising an abrasive brush and the abrasive bristles comprising same, and a method for producing or manufacturing same. Each abrasive bristle is of a resilient type and has a free outer bristle end carrying an enlarged abrasive globule of relatively fused bonding material and particulate abrasive material which may be mounted on a bristle end directly by a fused-in-

place junction between the bristle end and the globule or by auxiliary mounting or attachment means taking the form of an auxiliary bristle end member having said bonding material and particulate material fused thereto and with said auxiliary bristle end member being further provided with attachment means for attaching same to a corresponding free outer bristle member end. Said attachment means may comprise brazed junction means, mechanical engagement means, or any other suitable attachment means. The specification discloses several methods of manufacturing the abrasive bristles, and basically



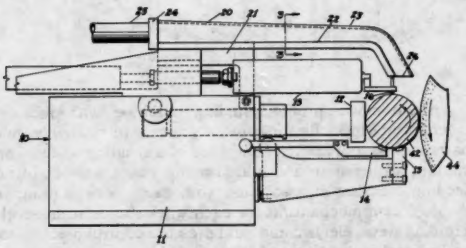
said method comprises applying to the end of a heat-resistant bristle member a particulate abrasive material and a fusible type of bonding material (which is either liquefied before such application, during such application, or subsequent to such application) in one or more applicatory and subsequent hardening steps until a substantial deposit of same has been applied to and condensed upon each free outer bristle member end so treated, to an extent such as to comprise and define one or more corresponding fused-in-place, enlarged abrasive globules.

3,696,564

COOLANT NOZZLE

Glover C. Joyce, Worcester, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 21, 1970, Ser. No. 74,055
Int. Cl. B24b *55/02*
U.S. Cl. 51—356 **4 Claims**



A coolant discharge nozzle for grinding machines fixedly secured to a steadyrest assembly movable into and out of operative engagement with a workpiece being ground, so that the nozzle outlet orifice is maintained in the proper spaced relation and in the proper attitude relative to the line of contact between a workpiece and a grinding wheel during the grinding operation performed on each of a series of similar workpieces.

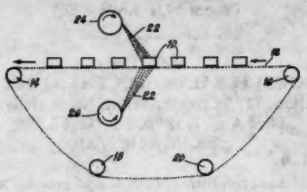
3,696,565

METHOD FOR DEFLASHING CERAMIC MATERIALS

Ronald Claeys, Mishawaka, Ind., assignor to Wheelabrator-Frye Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,762
Int. Cl. B24c *1/00*
U.S. Cl. 51—320 **6 Claims**

This invention is addressed to a new and improved method for deflashing unfired ceramic materials by centrifugal blast-



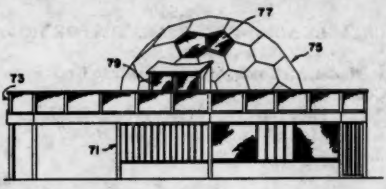
ing wherein the ceramic materials are subjected to an airless barrage of rubber particles.

3,696,566

SPHERE-DOME CONSTRUCTION

Horst Egon Phillip Langner, Calgary, Alberta, Canada, assignor to Langner Domes Ltd., Regina, Saskatchewan, Canada

Filed Sept. 28, 1970, Ser. No. 76,107
Int. Cl. E04b *1/342*
U.S. Cl. 52—80 **26 Claims**



A self-supporting dome-like or sphere-like structure made of interconnected linear or planar elements, comparable to a geodesic dome and comprising, in the full sphere approximation, 12 regular pentagons and, in the simplest case, 60 irregular but identical hexagons. For higher orders of the structure, the number of pentagons remains 12 but the number of hexagons increases according to the formula

$$N_k = 3N_{k-1} + 20,$$

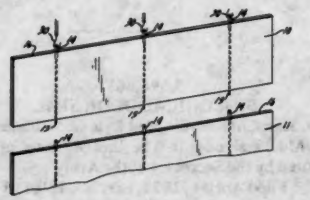
where N_k is the number of hexagons in a sphere approximation of order k, and N_{k-1} is the number of hexagons in a sphere approximation of order $(k-1)$.

3,696,567

PREFABRICATED BUILDING PANEL HAVING POSITIONER MEANS

Michel Villaneu, Paris, France, assignor to IBS Industrialized Building Systems Incorporated

Filed Dec. 21, 1970, Ser. No. 99,874
Int. Cl. E04c *1/10*
U.S. Cl. 52—98 **12 Claims**



A prefabricated cast concrete building panel is provided with an embedded fitting comprising a tubular positioner and a rod axially aligned with it. The upper end of the positioner projects from the top edge of the panel, and the lower end of the rod projects from the bottom edge of the panel. The em-

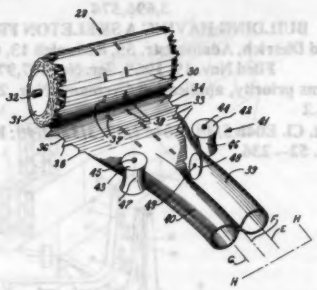
bedded ends of the positioner and rod have a screw thread relationship, so that by rotating the positioner the spacing between its top and the top edge of the panel may be varied. A sleeve may surround the positioner portion within the panel, and crushable means may be located within the panel directly beneath the lower end of the positioner. An opening in the positioner may be provided for engagement by connector means for lifting the panel.

3,696,568

COLLAPSIBLE, EXTENDIBLE DOUBLE TUBULAR STRUCTURE

Thomas G. Berry, Silver Spring, Md., assignor to Fairchild Hiller Corporation, Montgomery County, Md.

Filed Oct. 28, 1970, Ser. No. 84,724
Int. Cl. E04h *12/16*
U.S. Cl. 52—108 **7 Claims**



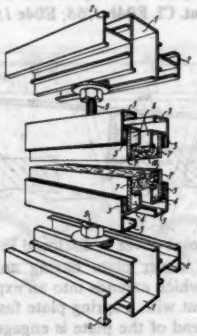
A collapsible, extendible element including an elongated thin metallic sheet pre-stressed to curl to form two hollow substantially cylindrical sections when unrestrained from a flattened condition. The elongated thin metallic sheet is adaptable to be rolled into a coil about an axis generally transverse to its longitudinal axis in a generally flattened condition. In several embodiments of the invention two lengthwise rows of slots are provided in the elongated thin metallic sheet that are located near the longitudinal central axis of the sheet and a series of tabs are located on the edges of the sheet that are adapted to be inserted in the slots when the elongated metallic sheet is unrestrained from a flattened condition.

3,696,569

DEMOUNTABLE PARTITION WALL

Yves M. Didry, 72, rue Pierre Semard, Evreux (Eure), France

Filed Dec. 23, 1969, Ser. No. 887,473
Claims priority, application France, Dec. 30, 1968, 68182211
Int. Cl. E04b *2/74*
U.S. Cl. 52—122 **5 Claims**



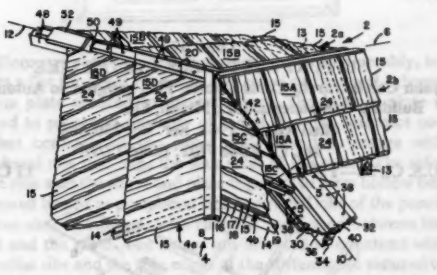
This invention relates to the production of a partition wall of a novel construction due to the use of two novel sections, one of which forms the top and bottom abutments and the frame, while the other forms the framework for the partition wall, the latter being connected to the top and bottom abutments in known manner by means of jacks, work on the site being limited solely to fitting the said jacks and fitting resilient fasteners of a known type which secure the facing panels to the sections.

3,696,570

BUILDING PANEL ENCLOSURES FOR VALLEY AND HIP STRUCTURES

John K. Kough, Morgan Hill; Otis M. Martin, San Jose, and Silas N. Miller, Saratoga, all of Calif., assignors to Ditz-Crane, San Francisco, Calif.

Filed Aug. 7, 1969, Ser. No. 856,235
Int. Cl. E04b *7/02*; E04d *1/20, 1/30*
U.S. Cl. 52—127 **5 Claims**



Prefabricated enclosure tip panels and a method of manufacturing the tip panels for enclosing valley and/or hip areas. The tip panel at one longitudinal end is beveled at an angle "*a*" which angle is dependent upon the relative angle between the two sections at the valley and/or hip joint. The other longitudinal end is adapted for interengagement with a standard panel. A method of manufacturing the tips includes segmenting a standard panel at the angle "*a*" to form a first valley tip panel and a first hip tip panel. A second standard panel is then segmented at an angle (180°−*a*) to form a second valley tip panel complementary to the first valley tip panel and a second hip tip panel complementary to the first hip tip panel. The tip panel segments are adapted to be joined in combination along the valley line and/or hip line to form a complete valley and/or hip construction and to engage standard panels. A valley flashing may be positioned along the valley center line and extend laterally relative to the center line beneath the valley tip panels to provide a hidden run-off path for water on the roof.

3,696,571

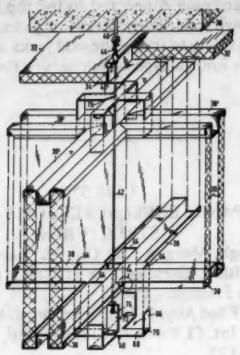
SUB-CEILING FOR BUILDINGS

Wolfram Schluter, Dusseldorf-Mettmann, Germany, assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 29, 1969, Ser. No. 888,407
Int. Cl. E04b *1/82*; E04c *3/32*
U.S. Cl. 52—144 **9 Claims**

A sub-ceiling or false ceiling adjoining the underside of a supporting ceiling structure or being downwardly spaced therefrom, the sub-ceiling including a cellular-, eggcrate- or honeycomb-like system of panels arranged in upright planes and held by essentially horizontal rails, said rails being about horizontally suspended from said ceiling structure and com-

prise a central downwardly open channel-section portion and lateral upwardly open channel section portions, said panels



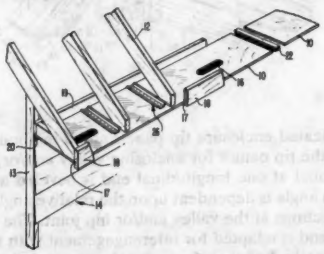
being fitted into and held by said lateral channel-section portions.

3,696,572

SUPPORT FOR PANELS AND THE LIKE

John Calvin Jureit, Coral Gables, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Filed Aug. 6, 1968, Ser. No. 750,660
Int. Cl. E04b 7/02; E04d 13/16
U.S. Cl. 52—173 11 Claims



The support has an elongated sheet metal plate bent about longitudinal axes to provide a pair of longitudinally extending edge portions upstanding from an intermediate portion. A pair of flanges are bent to extend outwardly from the edge portions. A plurality of teeth are struck from the intermediate body portion to extend normal thereto in a direction generally opposite to the direction in which the edge portions extend from the intermediate body portion. The teeth are embedded into the panel and the support reinforces the panel to preclude sagging, bowing and the like. The edge portions are flared outwardly such that the supports nest, one within the other, to form a packing assemblage. In one form of the packing assemblage, the teeth of each fastener extend through the slots left by the teeth struck in the intermediate portion of the support nested next below.

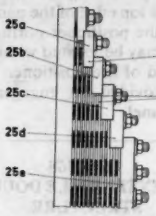
3,696,573

PRESSURE CONTAINER PRESTRESSED CONCRETE OR THE LIKE

Wolfgang Zerna, Hannover-Kirchrode, and Ludwig Muhe, Oberursel, Taunus both of Germany, assignors to Philipp Holzmann Aktiengesellschaft, Taunus-Anlage, Germany

Filed Nov. 25, 1969, Ser. No. 879,798
Claims priority, application Germany, Nov. 25, 1968, P 18 10 825.3
Int. Cl. E04c 3/20; F16l 9/04
U.S. Cl. 52—224 3 Claims

A pressure container is wound with special bands of wires in superposed groups and the wires are prestressed and clamped



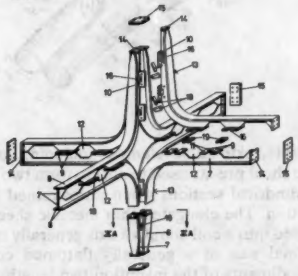
to the container by means of superposed axial strips on the container with radial bolts engaging the walls of the container.

3,696,574

BUILDING HAVING A SKELETON FRAME

Richard Dietrich, Adalbertstr. 55, 8 Munich 13, Germany

Filed Nov. 19, 1969, Ser. No. 877,976
Claims priority, application Germany, Nov. 22, 1968, P 18 10 434.2
Int. Cl. E04b 5/48; E04c 1/39, 3/32, 3/40; F16b 3/04
U.S. Cl. 52—236 16 Claims



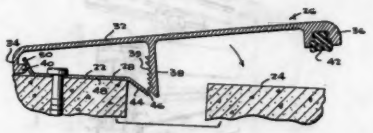
The skeleton frame of a building consists essentially of identical frame elements fastened to each other to form a system of parallelepiped-shaped cells, each cell being bounded by four frame elements which are at least in part common to two contiguously juxtaposed cells. The cells may be freely cantilevered from upright pillars or freely span distances between pillars which are multiples of the horizontal dimension of one cell.

3,696,575

EXPANSION JOINT COVER

Gary E. Armstrong, Oklahoma City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.

Filed June 7, 1971, Ser. No. 150,300
Int. Cl. E04b 1/68; E04c 1/34
U.S. Cl. 52—287 16 Claims



An expansion joint cover is disclosed in the form of an extruded elongated cover plate having an integral centrally oriented ratchet which extends into an expansion joint opening for engagement with a spring plate fastened to the structure so that one end of the plate is engaged with the ratchet and another end is engaged with the cover for urging the cover into holding relationship with the ratchet. In one embodiment, the cover is a planar member for spanning a joint formed

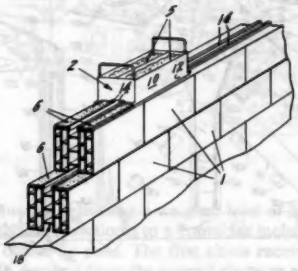
between co-planar wall sections, while, in another embodiment, the cover is an L-shaped member for spanning a joint oriented between perpendicular wall sections; in each case, the connective theory is substantially identical.

3,696,576

METHOD FOR THE CONSTRUCTION OF BRICK WALLS

Manuel Joaquim Monteiro de Barros, Carnaxide, Portugal, assignor to Eurofina-Investimentos E. Estudos Techicos E. Financeiros, S.A.R.L.

Filed Aug. 22, 1969, Ser. No. 852,391
Claims priority, application Portugal, Sept. 20, 1968, 50,341
Int. Cl. E04b 2/46; E04q 21/18, 21/20
U.S. Cl. 52—747 4 Claims



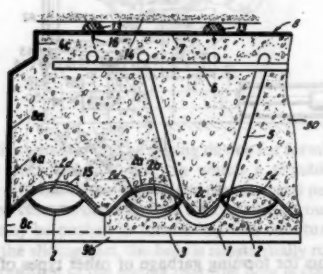
A wall of bricks is built with perfect alignment in a comparatively short time and with less mortar than is generally used in comparable walls. Each of the bricks in the wall has at its top a groove which has on each of its sides upwardly extending lips so that a caulking ruler can be positioned in the grooves of contiguous bricks to align them and a sled filled with mortar can be pushed over the top of a tier of bricks to deposit mortar on either side of the groove and thereby prepare the tier of bricks for a subsequent tier.

3,696,577

PREFABRICATED REINFORCED CONCRETE PLATE SHAPED CONSTRUCTION ELEMENT

Jean P. Bernold, and Hans Walter Pfeiffer, both of c/o Otto G. Beil, Kreuzstr. 32, Dusseldorf, Germany

Filed Dec. 23, 1969, Ser. No. 887,470
Claims priority, application Switzerland, Dec. 24, 1968, 19278/68
Int. Cl. F04b 1/18, 1/48
U.S. Cl. 52—583 5 Claims



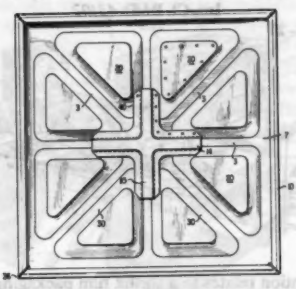
The plastic film seals the reinforced concrete from attack by water and seals joints established by adjacent reinforced concrete construction elements.

3,696,578

FLOOR PANEL FOR AN ELEVATED FLOOR ASSEMBLY

Eugene L. Swensen, Rockville, and Franklin E. Gibson, Baltimore, both of Md., assignors to Liskey Aluminum, Inc., Elkridge Landing Road, near Baltimore Friendship Airport, Md.

Filed March 6, 1970, Ser. No. 17,225
Int. Cl. E04c 2/32
U.S. Cl. 52—618 8 Claims



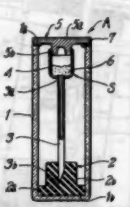
A floor panel to be used in an elevated floor assembly, includes a flat top sheet receptive to a tread surface and a drawn bottom plate secured to the top sheet. The bottom plate is formed to present a plurality of radial ribs that intersect one another centrally of the panel and extend to merge with peripheral ribs that edge the four sides of the panel. The sides of the ribs web the sheet and plate together to form hollow box sectioned beams as peripheral ribs and radial ribs of the panel. A cross-shaped stiffener with ridges is positioned between the sheet and the plate. The ridges are oriented to coextend with the radial ribs and the side edges of the stiffener are secured to the underside of the top sheet. A trim member is wedged between the edge of the sheet and the rim of the plate to abut the tread surface. The panel can be perforated to permit air circulation and the perforations do not cause any significant loss of structural strength.

3,696,579

METHOD OF AND DEVICE FOR PRESERVING DRUGS FOR INJECTION

Shozo Narusawa, and Noritoshi Iizuka, both of Tokyo, Japan, assignors to Yurin Tokushi Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 191, Jan. 2, 1970, Pat. No. 3,637,072. This application June 14, 1971, Ser. No. 152,529
Claims priority, application Japan, Jan. 9, 1969, 44/1840
Int. Cl. B65b 55/00
U.S. Cl. 53—21 R 1 Claim



A drug preservation container unit for use in connection with injection. It comprises a vertically elongated casing sealed with a cap and a needle assembly held in an upright position within said casing, said needle assembly containing a freeze-drying-processed drug for use in injection and arranged to be connected to a syringe. The unit contains such drug in such a small quantity as to be conveniently dispensed to a small number of persons. The invention also provides a

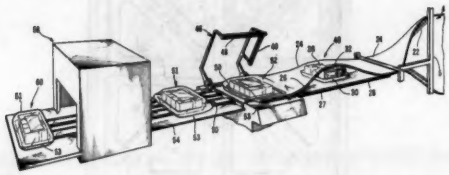
method of preserving drugs for use in injection in such a small quantity as mentioned above, comprising applying freeze-drying to the drug.

3,696,580

SHRINK FILM PACKAGING METHOD

Joseph M. Saltzer, Sr., 10775 69th Avenue North, Osseo, Minn.

Filed May 17, 1971, Ser. No. 143,757
Int. Cl. B65b *43/02*
U.S. Cl. 53—27 2 Claims



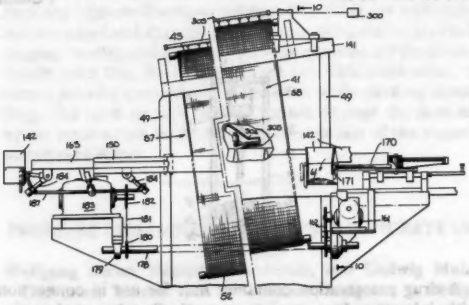
The invention relates to a shrink film packaging method by which articles intended for shipment by common carrier or to be sent through the mail may be wrapped so as to be protected from the usual and normal effects of handling. Articles to be wrapped are loaded onto a cardboard or plastic tray which is placed between the folds of two layers of material. The inner layer of material surrounding the tray and articles thereon is a special cushioning material which comprises closely spaced air bubbles formed by two sheets of polyethylene with air pockets formed therebetween. The outer layer of material is a shrink film and a sealer is utilized to form sealed edges around the tray and articles to form a package. The excess wrapping material is trimmed simultaneously as it is being sealed and the package is directed to a heat tunnel where the heat causes shrinkage of the outer shrink film which in turn causes the air in at least some of the bubbles of the inner material to be compressed to a pressure greater than atmospheric pressure.

3,696,581

MACHINE AND METHOD FOR TRANSFERRING PREDETERMINED AMOUNTS OF MATERIAL

Bernard C. Eisenberg, Rockaway, N.J., assignor to Salbern Corp., Fairfield, N.J.

Division of Ser. No. 794,083, Jan. 17, 1969, Pat. No. 3,621,891. This application March 25, 1971, Ser. No. 127,882
Int. Cl. B65b *1/06, 3/26*
U.S. Cl. 53—35 19 Claims



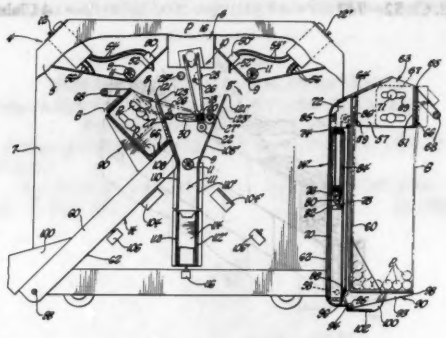
An inclined material delivery means is provided and has passing therethrough a plurality of intermediary receptacle means for receiving predetermined amounts of material to subsequently be transferred to a container. The intermediary delivery means is agitated to provide a uniform and precise amount of material and contains on the bottom thereof door members which synchronize movement of the container therewith in the discharge area. Cutting means are provided to aid in proper filling of the intermediary receptacles as well as air supplies to appropriately direct the material being packaged.

3,696,582

COIN PACKER

Lester B. Lodrick, 42687 Lonl, Sterling Heights, Mich., and Vincent N. Teno, 5078 Babbit, Troy, Mich.

Filed Dec. 22, 1970, Ser. No. 100,640
Int. Cl. B65b *57/10*
U.S. Cl. 53—59 38 Claims



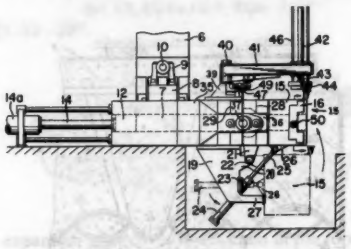
Wrapped coin packaging apparatus including a housing having an inlet for receiving wrapped coin packages, a pair of receptacle filling locations spaced from each other on opposite sides of the inlet, and transfer means operable to successively receive coin packages at the inlet and transfer the packages individually to one of the filling locations. The transfer means is selectively adjustable between a first operating position in which it transfers packages from the inlet to one of the filling locations, and a second operating position in which it transfers packages from the inlet to the other of the filling locations.

3,696,583

APPARATUS FOR FORMING PACKED REFUSE BLOCKS

Kunitoshi Tezuka, 14-3, 6-chome, Higashi Suna, Tokyo, Japan

Filed April 13, 1971, Ser. No. 133,531
Claims priority, application Japan, April 18, 1970, 45/32715
Int. Cl. B65b *63/02*
U.S. Cl. 53—124 D 12 Claims



Apparatus for forming garbage or other types of refuse by compression into a mass or into blocks, and packing and/or wrapping the same with a wire net or the like, in which a bucket-like container is swingably mounted at the outlet opening of a compressing device, the container being arranged to make half a turn so as to allow the fitting of the wire net, the

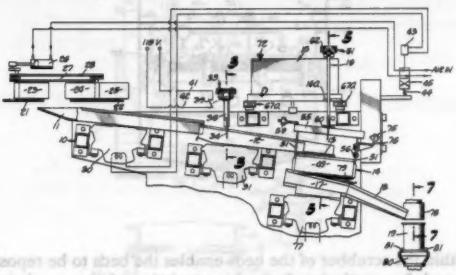
packing treatment and the release of the packed garbage or refuse block in a sequential operation.

3,696,584

APPARATUS FOR FILLING A CONTAINER WITH A WEIGHED LOAD OF FRAGILE ARTICLES

Donn J. Rickard, Glendora, Calif., assignor to Brown International Corporation, Covina, Calif.

Filed Oct. 23, 1970, Ser. No. 83,390
Int. Cl. B65b *5/10*
U.S. Cl. 53—239 5 Claims



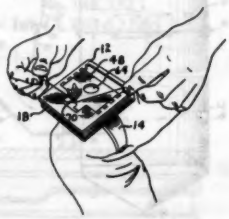
Apparatus for delivering a weighed load of fragile articles, such as grapefruit sections, to a container includes a series of vibratory chutes or pans. The first chute receives articles in response to demand from the second chute or pan into which it discharges, so that articles in said pan remain at a one-layer depth. This promotes maximum control of feeding of articles from the pan into a clamshell-type hopper pendantly supported on a weighing scale. When the required weight of fragile articles is accumulated within the hopper, the clamshell sections open automatically to discharge the weighed load into a filling chute leading to an open top container. Syrup is introduced into the filling chute when the hopper opens in order to lubricate the filling chute and to facilitate entry of the fragile articles one by one into the container along with the syrup.

3,696,585

FISH BAIT CONTAINER AND WRAPPING DEVICE

Charles P. Ritter, 704 East Prairie Road, Dowagiac, Mich.

Filed Oct. 23, 1970, Ser. No. 83,386
Int. Cl. B65b *67/08*
U.S. Cl. 53—390 8 Claims



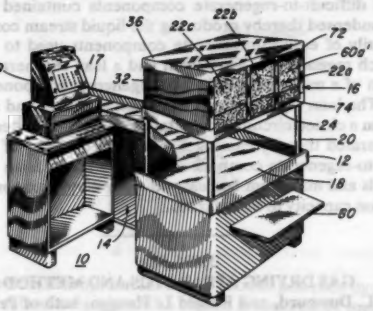
A fish bait container and wrapping device for forming a parcel of bait enclosed in fabric, in which a slidable part is disposed in a frame-like member, the member and part having two opposed slots, which together form a hole through which the fabric may be pushed to form a bag-like structure. In one position of the sliding part, the hole is substantially round, and in another position of the sliding part, the hole is restricted to clamp and hold the bag-like structure. The pieces of bait are inserted in the bag-like structure after it has been formed, and the bag is tied while it is held between the sliding part and the frame-like members. The wrapping mechanism may form a lid on a container for the bait, and the container has a means for securing the device to the leg of a fisherman.

3,696,586

BAGGING AND CHECKOUT COUNTER SYSTEM

Fred L. Sparks, 3601 Red Bluff, Apt. 32-C, Pasadena, Tex.

Filed March 31, 1971, Ser. No. 129,722
Int. Cl. B65b *67/00*
U.S. Cl. 53—390 1 Claim



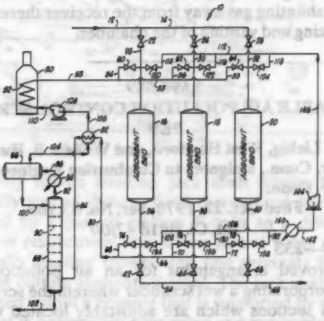
This invention relates to bagging and checkout counter systems of the type used in supermarkets such as grocery stores and the like. The system includes a counter having a merchandise unloading end defined by the counter's flat deck, and a bag dispensing unit positioned directly above the flat deck at a sufficient elevation from the deck to allow for the free passage of the merchandise under the bag dispensing unit. The bag dispensing unit comprises a plurality of drawers each sized to accommodate a distinct size bag. Each drawer is divided into two bag storage compartments symmetrically disposed on either side of a vertically extending center partition wall. Means including spring means on either side of the partition wall urge the piles of bags stacked within each compartment outwardly toward a window from which individual bags can be easily withdrawn on opposite sides of the bag-dispensing unit.

3,696,587

ADSORPTION PROCESS FOR RECOVERING EASY-TO-REGENERATE CONDENSIBLE COMPONENTS FROM A MULTICOMPONENT GAS STREAM

Gary Clifford Young, Pawhuska, and Joseph A. Kleinpeter, Ponca City, both of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed April 2, 1971, Ser. No. 130,691
Int. Cl. B01d *53/04*
U.S. Cl. 55—62 8 Claims



The present invention relates to an improved cyclic adsorption process for recovering easy-to-regenerate condensible

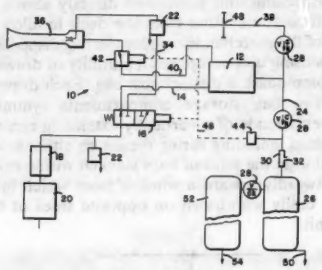
components from a multi-component gas stream. After contact with the inlet gas stream the adsorbent bed or beds containing easy and difficult-to-regenerate components are regenerated by contact with a lean regeneration gas stream. The resulting rich regeneration gas stream is contacted with a liquid stream consisting primarily of easy-to-regenerate components so that a major portion of the difficult-to-regenerate components contained therein are absorbed and removed by the liquid stream. The remaining rich regeneration gas stream is cooled so that easy-to-regenerate components and additional difficult-to-regenerate components contained therein are condensed thereby producing the liquid stream comprised primarily of easy-to-regenerate components used to contact the rich regeneration gas stream and a lean regeneration gas stream of a minimum difficult-to-regenerate component content. The lean regeneration gas stream is heated and recirculated in a closed circuit into contact with the bed or beds being regenerated thereby causing a maximum quantity of the difficult-to-regenerate components to be removed from the bed or beds and maximum bed easy-to-regenerate component adsorption capacity to be realized.

3,696,588

GAS DRYING APPARATUS AND METHOD

Jules L. Dussourd, and Ronald L. Haugen, both of Princeton, N.J., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,603
Int. Cl. B01d *53/04*
U.S. Cl. 55—163 **7 Claims**



The apparatus comprises a desiccant chamber, operatively disposed between a gas compressor and a receiver, through which a gas to be dried therein is conducted, and valving for depressurizing the chamber and venting the same to atmosphere, when the receiver is fully charged. A pressure-sensing element automatically operates the valving. The apparatus has means insuring a valved return to a receiver-charging condition or operational mode automatically following apparatus shut down. The method sets forth the steps of chamber-drying the gas, monitoring the chamber-charged condition, shunting gas away from the receiver thereafter, and depressurizing and venting of the chamber.

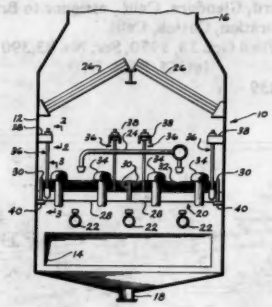
3,696,589

ADJUSTABLE AIR POLLUTION CONTROL SCRUBBER BED

Preston D. Liebig, West Hartford, and William B. Hurlbut, Sr., Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1970, Ser. No. 83,103
Int. Cl. B01d *47/00*
U.S. Cl. 55—233 **4 Claims**

An improved arrangement for an air pollution control system incorporating a wet scrubber wherein the scrubber bed is made in sections which are adjustably located within the scrubbing housing. The scrubber bed is formed of standard size modules and each module is supported within the scrubber housing for adjustment therein. The number of modules is dependent upon the preliminary design characteristics for the pollution control desired to be achieved for the particular combustion system, while the adjustability



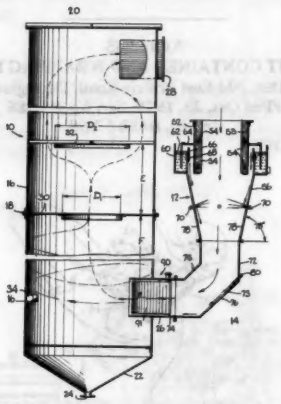
within the scrubber of the beds enables the beds to be repositioned for particular flow characteristics of the gas being scrubbed.

3,696,590

GAS SCRUBBING SYSTEM

Charles A. Richmond, Pompton Plains, N.J., assignor to Nichols Engineering & Research Corporation, New York, N.Y.

Continuation of Ser. No. 636,152, May 4, 1967, abandoned.
This application Aug. 14, 1969, Ser. No. 850,265
Int. Cl. B01d *47/10*; B01f *3/04*
U.S. Cl. 55—238 **8 Claims**



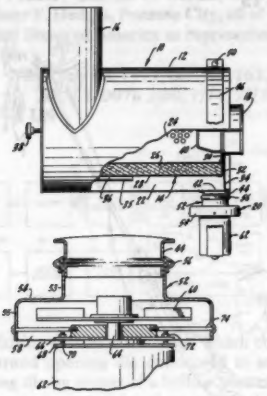
Gas scrubbing system comprising a flat surfaced tapered input quencher sealed to an entrance duct via a water seal arrangement which includes a weir arrangement to control a flow of flushing water, an elbowed connector having flat internal surfaces a spin damper having upper and lower finite clearances and a cyclonic scrubber with supplemental tangential air inlets at the spin damper level, doughnut and disc shaped baffle plates semi-tangentially oriented gas outlet and individually supplied water spray nozzles.

3,696,591

AIR CLEANER WITH IMPROVED UNLOADING APPARATUS

Raymond G. Bennett, Olympia Fields, Ill., and Mark Luedi, Valparaiso, Ind., assignors to Novo Industrial Corporation-United Air Cleaner Division, New York, N.Y.

Continuation of Ser. No. 790,259, Jan. 10, 1969, abandoned. This application June 7, 1971, Ser. No. 150,819
Int. Cl. B01d *59/50*
U.S. Cl. 55—337 3 Claims



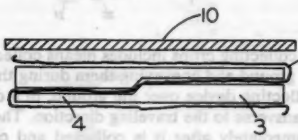
An air cleaner of the dry type having a generally cylindrical housing with an air inlet at one end and a clean air outlet at the other end, said housing constructed to set up a helical swirling motion of air therein to centrifuge dust particles to the outside, and a generally cylindrical annular filter element assembly centrally disposed within the housing. In addition the air cleaner includes a dust unloading apparatus having a port for dust removal, a means for moving air which produces suction at the port and a power source for driving said means.

3,696,592

TAPERED SEPARATOR FOR PLEATED FILTER

Donald E. Engleman, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 882,385, Dec. 5, 1969, abandoned, which is a division of Ser. No. 757,841, Sept. 6, 1968, Pat. No. 3,541,829. This application May 20, 1971, Ser. No. 145,332
Int. Cl. B01d *27/06*
U.S. Cl. 55—500 2 Claims



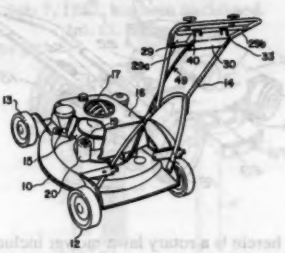
A tapered separator for a pleated filter formed from a blank of foldable sheet material having one portion folded in zigzag formation to present first fold increments of a first selected height and the remaining portion folded in zigzag fashion to present second fold increments in substantially end-to-end relation with said first fold increments and of a second selected height different from the height of said first fold increments to thereby provide a tapered configuration to the separator.

3,696,593

ELECTRIC START FOR MOWERS

Richard A. Thorud, Minneapolis; James J. Snegoski, Shakopee, and Kenneth N. Hasenbank, Minneapolis, all of Minn., assignors to Toro Manufacturing Coporation, Minneapolis, Minn.

Filed Sept. 4, 1968, Ser. No. 757,329
Int. Cl. A01d *35/26*
U.S. Cl. 56—17.5 16 Claims



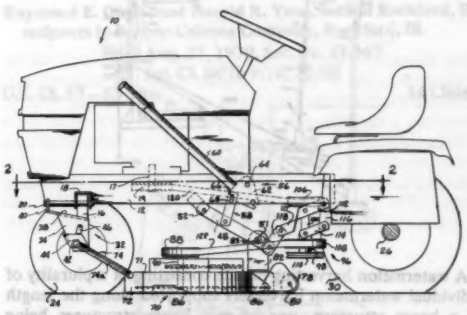
An electric start system for a lawn mower powered by an internal combustion engine. The engine is cranked by means of a Bendix type starter, the pinion of which engages the engine flywheel during the cranking operation, and then automatically disengages therefrom when the engine starts. The electric motor of the Bendix starter is powered by batteries carried on the handle of the mower and is energized by a key switch also on the handle within easy and convenient reach of the operator. A charger is also provided which enables the battery to be recharged on or off the mower. The battery also has a single receptacle connector for selective connection to the starter motor and charger, whereby the engine cannot be started when the battery is being recharged.

3,696,594

STROKING JACK SHAFT FOR A BELT DRIVE

John H. Freimuth, New Holland, and Joseph C. Hurlburt, Leola, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed July 7, 1971, Ser. No. 160,289
Int. Cl. A01d *35/26*
U.S. Cl. 56—15.2 8 Claims

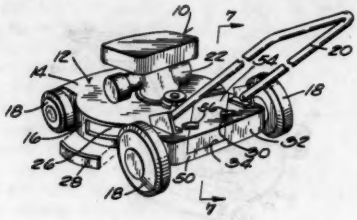


A rotatively driven stroking jack shaft having first and second axially spaced sheaves fixed thereto and drivingly interconnected by a pair of endless V-belts to a driving and driven sheave respectively, the driven sheave being disposed on a vertically floating mower unit and drivingly interconnected to the cutting elements thereof. The jack shaft is rotatively mounted within a housing that is supported by a linkage structure that is operatively connected and moveably responsive to the vertical floatation of the mower unit such that substantial misalignment between the drive belts and respective connected sheaves is avoided.

3,696,595
LOW-VELOCITY DISCHARGE MEANS FOR ROTARY MOWERS

Einar S. Dahl, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed July 15, 1970, Ser. No. 55,144
Int. Cl. A01d *35/26*
U.S. Cl. 56—16.9 21 Claims

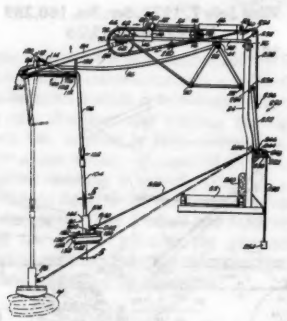


Disclosed herein is a rotary lawn mower including a paddle wheel or fan which is located in the blade housing and freely rotatably supported on the engine output shaft and rotated at a rate of rotation less than the cutting blade. Radially extending paddles move in the path of grass clipping discharge and reduce the velocity of impelled missiles caused by impact with the cutting blade to the low tip velocity of the paddles to minimize danger to bystanders and the mower operator. A horizontal partition located between the cutting blade and the paddle wheel and extending around the blade housing beneath one or more mower grass clipping discharge outlets prevents direct discharge of any missiles through the outlets.

3,696,596
WATERMELON HARVESTING DEVICE

Stanley C. Wegscheid, P.O. Box 336, La Belle, Fla.

Filed March 23, 1970, Ser. No. 21,867
Int. Cl. A01d *51/00*
U.S. Cl. 56—327 18 Claims



A watermelon harvesting device consisting of a plurality of individual watermelon harvesters supported along the length of a boom structure, one of said boom structures being adapted to be fixed to each side of a vehicle such as a truck or tractor in a laterally outwardly extending disposition whereby the vehicle may be driven along a path or road extending through a watermelon field with the harvester supporting booms extending outwardly to overlie certain of the beds of the watermelon field on each side of the vehicle. Each of the watermelon harvesters comprises a vacuum controlled watermelon engaging head and hydraulically electrically controlled mechanical means whereby a watermelon when engaged by said head may be automatically lifted and swung into position over a conveyor means, the watermelon when reaching this position is automatically deposited on said conveyor means with the head being returned to a position to engage another watermelon. One or more of said watermelon harvesters may be operated by one person.

3,696,597
RESILIENT LINKAGE FOR LIMB SHAKER

Evan L. Sitter, P.O. Box 95, McLean, Tex., assignor to Spencer B. Sitter

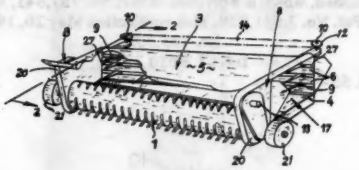
Filed April 16, 1971, Ser. No. 134,581
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 TS 10 Claims

Fruit bearing limbs are shaken with a boom at the natural frequency of the limb to shake the fruit therefrom. The boom is vibrated by a resilient linkage which includes two coaxial, helical springs in compression with excitation transmitted midway therebetween.

3,696,598
APPARATUS FOR COLLECTING CROPS

Ernst Weichel, Bahnhofstr. 1, 7326 Heiningen, Germany

Filed April 17, 1969, Ser. No. 817,626
Claims priority, application Germany, April 19, 1968, P 17 57 270.2
Int. Cl. A01d *89/00*
U.S. Cl. 56—364 25 Claims



A device for collecting crops includes means collecting the crops from the ground and conveying them during the movement of the collecting device over the ground, in a direction substantially transverse to the traveling direction. The crop is compressed immediately after it is collected and conveyed during its compression in the transverse direction. A conveying duct is oriented behind a collecting drum which is adapted to be positioned adjacent the ground. The conveying duct widens in a conveying direction in the manner of a wedge and conveyor means are arranged to run in a direction transverse to the collecting drum to move the collected crop along the conveying duct and to transfer it, for example, into a receiving truck. The outlet port for the conveying duct is arranged laterally next to and behind the collecting drum. The collecting drum may be advantageously mounted on a pivotal arm

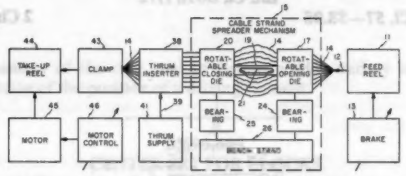
which may also telescopic so that it may be positioned directly adjacent the entrance to the collecting duct and operated, for example, in conjunction with a mower. The collecting duct itself advantageously includes baffle plates or wall elements which may be pivoted to accommodate the feeding to a selected orientation and size for facilitating the feeding to a collecting truck.

3,696,599

CABLE FAIRING SYSTEM

Donald M. Palmer; Charles C. Cotton, both of Lynn Haven, and Willmer F. Hodges, Panama City, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 16, 1971, Ser. No. 163,185
Int. Cl. D07b 3/00, 1/14, 7/18
U.S. Cl. 57—1 UN **10 Claims**



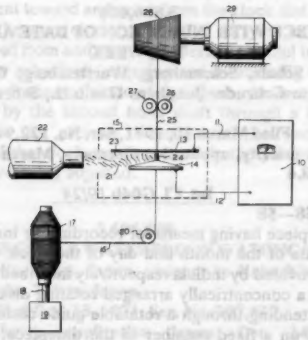
A cable fairing system is disclosed which contains a rotatable cable strand opening die connected to a rotatable cable strand closing die by means of a hollow, slotted tube. Bearings respectively connected to brackets attached to a bench support said dies for rotation therein. A feed reel supplies multistrand cable for threading through said dies and hollow tube, and a take-up reel receives the reconstructed cable after thrums have been inserted between the opened strands thereof by a human or other operator. A controlled motor drives said take-up reel at such speed as to pull the multistrand cable through the aforesaid dies and tube and still allow the aforementioned thrums to be installed therein immediately prior to the reconstruction thereof.

3,696,600

APPARATUS FOR PRODUCING CORE YARN

Mayer Mayer, Jr., New Orleans; James I. Kotter; Harold L. Salaun, Jr., both of Metairie, and Roger S. Brown, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed April 12, 1971, Ser. No. 132,953
Int. Cl. D01h 1/12
U.S. Cl. 57—5 **4 Claims**



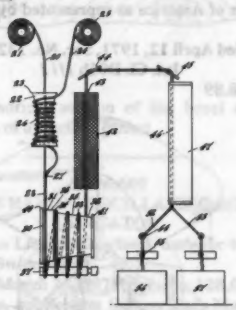
This invention relates to a process for the continuous formation of various types of core yarn by the use of electrostatic, physical and chemical means. More specifically, the invention relates to a process for electrostatically, peripherally surfacing or sheathing a coring yarn with individual fibers and means for treating the coring yarn with a crosslinking chemical formulation to permanently set the yarn configuration.

3,696,601

TEXTILE HEATING AND COOLING

Henry W. McCard, 208 Rodman Avenue, Jenkintown, Pa.

Continuation-in-part of Ser. No. 751,785, Aug. 12, 1968, Pat. No. 3,518,822. This application Nov. 7, 1969, Ser. No. 874,764. The portion of the term of this patent subsequent to July 7, 1987, has been disclaimed.
Int. Cl. D02g 1/02
U.S. Cl. 57—34 HS **9 Claims**



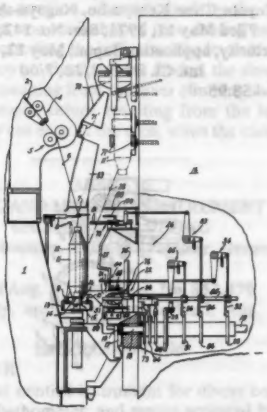
In order to accomplish rapid cooling of synthetic thermoplastic continuous filament yarn which has been heated for bulking or the like, the yarn is led along a groove and subjected to jets of cooling gas spaced along the groove. For bulking in the preferred form the yarn is false twisted and heated suitably by a rotating drum heater having a smooth descending conical portion toward a take off end, and a downward step at one end of the smooth conical portion. In another form, the drum heater has two right cylindrical portions of different diameter, the smaller being at the outlet end, and a step separating them. In another form two ends of yarn are applied, and then the yarn is continuously brought into or against a heater, preferably a rotating drum heater.

3,696,602

MEANS FOR DOFFING A BOBBIN AND FORMING A TRANSFER TAIL

Raymond E. Olson, and Harold R. Yone, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Aug. 27, 1970, Ser. No. 67,367
Int. Cl. D01h 9/10, 15/00
U.S. Cl. 57—53 **14 Claims**



In a spinning frame, or the like, a filled bobbin and its trailing bobbin thread are simultaneously removed from a spindle

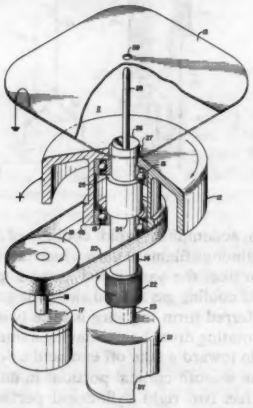
in a single doffing operation. At least one turn of the trailing thread is then wound as a transfer tail on the cleared spindle in a position to be pinched by the empty bobbin being donned in order to couple the thread to the donned bobbin. The thread is then severed near the spindle between the spindle and the bobbin.

3,696,603

ELECTROSTATIC FIBER COLLECTING AND YARN SPINNING APPARATUS

James I. Kotter; Harold L. Salaun, Jr., both of Metairie, and Roger S. Brown, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed April 12, 1971, Ser. No. 132,952
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 5 Claims



By combination and interaction of electrostatic and mechanical forces, airborne opened fibers are transported, parallelized, collected en masse and twisted to continuously form a high quality textile yarn. The invention also relates to a method and apparatus for continuous formation of a variety of yarns from the basic fiber spinning apparatus.

3,696,604

CENTRIFUGAL SPINNING DEVICE

Choji Nozaki; Kiichi Kono; Toshikiko Sakai, and Osami Kamigaito, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kentyusho, Nagoya-shi, Japan

Filed May 11, 1971, Ser. No. 142,142
Claims priority, application Japan, May 12, 1970, 45/46323
Int. Cl. D01h *1/12, 7/00*
U.S. Cl. 57—58.95 11 Claims

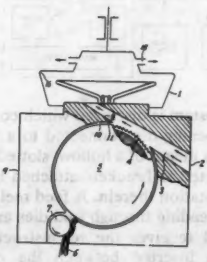
A centrifugal spinning device having a feed roller and a presser to feed sliver into a fiber liberating device including an opening roller therein, a spinning rotor for depositing liberated fibers supplied from the fiber liberating device within a cavity therein, and a guide tube installed on the axis of rotation of the rotor for guiding out twisted yarn from the rotor, provided with the improvement wherein the entrance opening of the guide tube is formed by ceramic or ceramic composite material, thereby to obtain good spinning stability.

3,696,605

RINGLESS SPINNING MACHINE

Takashi Morikawa, Amagasaki; Sotomatsu Higake, Osaka-fu; Mitsugu Sumi, Fukui; Tohoru Urifu, Fukui, and Manabu Yamamoto, Fukui, all of Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka, Japan, and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 14, 1969, Ser. No. 876,918
Claims priority, application Japan, Nov. 27, 1968, 43/03802
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 2 Claims



A ringless spinning machine which has an air intake channel communicating with a rotatable spinning chamber operating at subatmospheric pressure. A combing roller having a plurality of saw teeth thereon as a part of the periphery exposed in the air intake channel so that air flowing therethrough can strip fibers from the peripheral surface of the combing roller. The junction defined by the wall surface on the fiber transfer side of the air intake channel at the forward end of the opening through which the combing roller projects and the wall surface of the space within which the combing roller rotates is in the form of a gently curved surface or a flat surface. A filter member having a filtering area larger than the area of the inlet end of the air intake channel is provided at said inlet end.

3,696,606

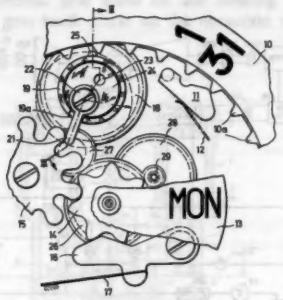
TIMEPIECE WITH INDICATION OF DATE AND DAY OF THE WEEK

Gunther Scholz, Schramberg, Wurttemberg, Germany, assignor to Gebruder Junghans G.m.b.H., Schramberg, Germany

Filed March 10, 1971, Ser. No. 122,941
Claims priority, application Germany, March 18, 1970, G 70 10 018.4
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 4 Claims

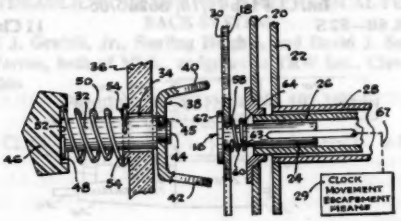
A timepiece having means for recording, or indicating, data of the date of the month and day of the week wherein such data is provided by indicia respectively inscribed on a rotating ring and a concentrically arranged rotating disk. A first shift finger extending through a rotatable guide casing is pivotally mounted on a fixed member in the timepiece, and engages means for drivingly advancing the disk. A second shift finger is mounted on the guide casing and engages the ring. The shift fingers are disposed in different planes to avoid contact by the first shift finger with driven teeth on the ring. Rotation of the guide casing serves to rotate the shift fingers, and hence the

ring and disk. The first shift finger is mounted eccentrically with respect to the guide casing so as not to interfere with



movement of the ring, and to permit a wide variety in the selection of the position of a driving element.

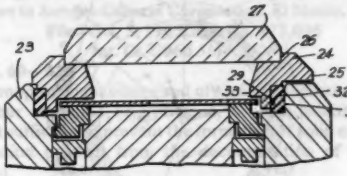
3,696,607
CENTER SET FOR CLOCKS
Samuel Dinerstein, Lake Geneva, Wis., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Feb. 22, 1971, Ser. No. 117,532
Int. Cl. G04b *27/00*
U.S. Cl. 58—85.5 **10 Claims**



A clock hand setting mechanism mounted upon the crystal of a clock and having a manually manipulatable setting stem whose axis is substantially coincident with the axes of the hour, minute, and second hand shafts which extend from the clock movement, the setting stem being adapted for longitudinal movement toward and away from the clock dial, with the extremity of the stem closest to the dial carrying at least one finger displaced from and running generally parallel to the axis of the stem for selectively engaging and rotationally adjusting the second and minute hands of the clock, the second hand being driven by the second hand shaft through a frictional clutch device to prevent damage to the escapement mechanism of the clock movement while the position of the clock hands are being adjusted.

3,696,608
NON-CIRCULAR WATERPROOF WATCHCASE
Kanji Miyashita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Dec. 13, 1971, Ser. No. 207,412
Claims priority, application Japan, Dec. 14, 1970, 45/110797
Int. Cl. G04b *37/08, 39/00*
U.S. Cl. 58—90 R **4 Claims**

In a non-circular watchcase, a bezel having a non-circular opening for reception of a non-circular watch glass has a cylindrical portion below the region for reception of the watch glass. The case-body has a circular opening so that it can



receive the cylindrical section of the bezel and be sealed thereto by means of a circular gasket.

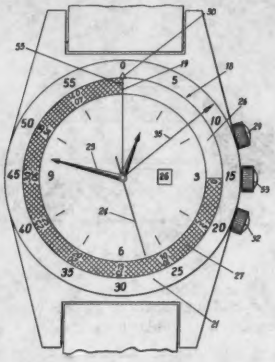
3,696,609
TIMEPIECE HAVING OSCILLATING ROTATION INDICATOR
Gerald Dubois, Le Lieu, Switzerland, assignor to Marcel Mingard, Geneva, Switzerland
Filed March 25, 1971, Ser. No. 128,058
Claims priority, application Switzerland, March 26, 1970, 4600/70
Int. Cl. G04b *19/02*
U.S. Cl. 58—125 R **3 Claims**

A timepiece with an oscillating rotating indicator, accomplishing slow displacements followed by instantaneous return to initial starting position, characterized by the fact that it comprises at least one snail-shaped cam driving an oscillating rotating lever controlling the indicator, the lever being pressed against the cam by an elastic return device, the slow travelling of the indicator resulting from the lever climbing the snail-cam and its instantaneous return resulting from the lever falling along the sharply cut edge of the cam, when the cam rotates.

3,696,610
CONTROL AND MEASURE INSTRUMENT FOR UNDERWATER DIVING
Georges R. Charbonnier, 8, avenue Peschier, Geneva, Switzerland
Filed Aug. 27, 1969, Ser. No. 853,470
Claims priority, application Switzerland, Aug. 29, 1968, 13109/68
Int. Cl. G04b *47/06*
U.S. Cl. 58—145 R **4 Claims**

A measure and control instrument for divers comprising a time counter, a bathometer, and means actuated by said time counter and bathometer for automatically and continuously indicating the duration of the decompression stage to be ob-

served by a diver. Such means comprises a mechanism driving at least one indicating member in an intermittent movement



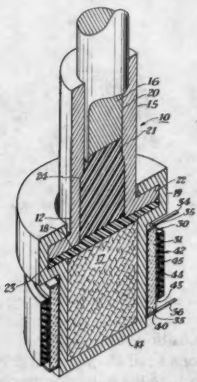
the frequency of which is constant and the amplitude of which varies with the depth of submersion.

3,696,611

THERMAL MOTORS

Thomas E. Noakes, Detroit, Mich.; Thomas P. Konen, Somerville; Albert Kokalari, South Plainfield, both of N.J., and Robert B. Duggan, East Aurora, N.Y., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Sept. 17, 1969, Ser. No. 858,595
Int. Cl. F03g *7/00;* **H01h** *71/16;* **H01c** *7/04*
U.S. Cl. 60—23 **11 Claims**



An electrical-to-thermal-to-mechanical power translating device comprising a mass of solid-to-liquid expansion material packed into a piston-cylinder chamber and heated electrically by a positive temperature coefficient thermistor for developing piston movement. The thermistor is a current limiting device which automatically controls the length of the piston stroke by self-regulating the upper operating temperature level.

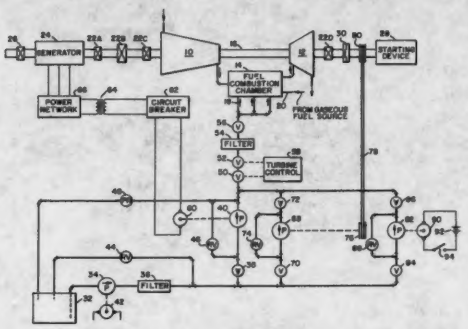
3,696,612

FUEL PUMP SYSTEM FOR GAS TURBINES

Paul A. Berman, Plymouth Meeting, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1970, Ser. No. 102,618
Int. Cl. F02c *7/26*
U.S. Cl. 60—39.14 **7 Claims**

A fuel pump system for a gas turbine of the type in which a main fuel pump is normally driven by an electric motor powered from an external electrical network. An auxiliary fuel pump is connected in a parallel hydraulic circuit arrangement with the main fuel pump and is activated by a battery-driven



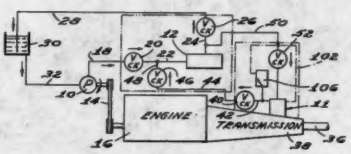
motor or driven by a mechanical starting device for the turbine when it becomes necessary to "black start" the turbine with no external source of electrical power available for the main fuel pump.

3,696,613

HYDRAULIC STEERING SYSTEM HAVING AUXILIARY POWER SOURCE

William B. Goodale, Orchard Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 763,228, Sept. 27, 1968, abandoned.
This application July 31, 1970, Ser. No. 64,130
Int. Cl. F15b *15/18;* **B62d** *5/06*
U.S. Cl. 60—52 S **11 Claims**



A hydraulic steering system for a motor vehicle having a primary fluid pressure source and a secondary pressure source. The secondary source comprises a pump driven by the vehicle's transmission upon demand and which is inoperative when the primary pressure source is functioning properly.

3,696,614

RECIPROCATING PISTON MACHINE WITH A ROTARY HYDRAULIC DISPLACER BETWEEN PISTONS AND MACHINE SHAFT

Rudolf Hartmann, Holderlinstr. 4, 6238 Hofheim, and Horst Zimmermann, Am Hasensprung 16, 6241 Mammolshain, both of Germany

Filed May 12, 1971, Ser. No. 142,684
Int. Cl. F15b *7/00;* **F04b** *9/08, 17/00, 35/00;* **F03c** *3/00*
U.S. Cl. 60—54.5 R **11 Claims**

A reciprocating piston machine comprises a housing structure with hydraulic cylinders, piston means reciprocable in said respective cylinders, and a revolvable shaft. A hydraulic displacer mechanism has oil columns in the respective cylinders for linking the displacer mechanism with the pistons, the displacer mechanism comprises a stationary annular portion coaxial with the shaft and forming part of the housing structure. The annular portion has inwardly open chamber recesses distributed along its inner periphery and communicating with the oil columns. The hydraulic displacer mechanism has a rotor diametrically smaller than the interior of the annular

housing portion and connected with the shaft in eccentric relation thereto, the rotor is consecutively engageable with the recesses to thereby vary the oil volume in the chambers. A circle of fixed internal gear teeth on the housing structure, meshes with a gear-teeth circle on the eccentric rotor. The

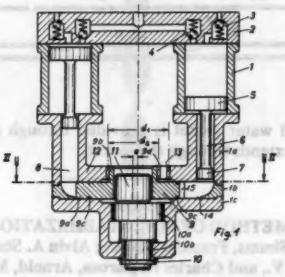


Fig. 1

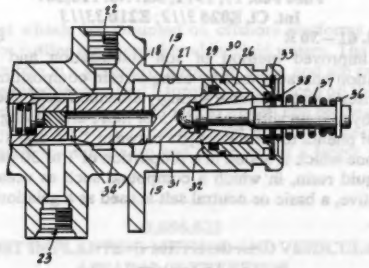
latter circle has a smaller diameter than the circle of the fixed gear teeth and is in rolling mesh engagement therewith, whereby during operation the rotor sequentially coacts the said respective recesses to form variable volume chambers together therewith.

3,696,615

HYDRAULIC HOLD-OFF FOR A MECHANICAL FEEDBACK SYSTEM

Paul J. Grabill, Jr., Sterling Heights, and David J. Suttkus, Warren, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Jan. 18, 1971, Ser. No. 107,108
Int. Cl. F15b 7/00, 13/10
U.S. Cl. 60—54.6 P **6 Claims**



A movable sleeve is pushed against a stop by hydraulic pressure supplied to a pressure chamber during the hydraulic power curve. A continuous biasing means such as a spring feeds back force proportionally while it is supported by such hydraulic pressure. During a time when there is insufficient force to act against the sleeve, the spring together with its associated actuating elements picks up the sleeve and carries it along. The cavity within which the sleeve moves permits enough travel to form a mechanical train link without picking up the force reaction spring, thereby solving the problem of accumulating the undesirable force when pushing through in a fail-safe operation.

3,696,616

NON-CARBON FORMING MONOPROPELLANT PROCESS USING A LOWER ALKYLHYDRAZINE AND AMMONIA

James M. Lucas, El Dorado Hills; Jack K. Suder, Fair Oaks, and Eugene M. Vander Wall, Citrus Heights, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Oct. 5, 1967, Ser. No. 673,016
Int. Cl. C06d 5/04, 5/08
U.S. Cl. 60—218 **9 Claims**

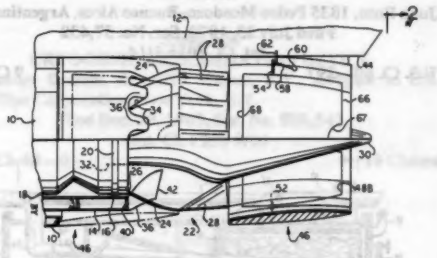
A monopropellant comprised of an alkyl hydrazine containing either ammonia or hydrazine, or both additives in an amount sufficient to prevent the formation of solid carbon as a combustion product from the decomposition of the basic material.

3,696,617

TURBO-FAN PROPULSION APPARATUS AND OPERATING METHOD

Peter H. Ellis, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Nov. 10, 1969, Ser. No. 875,201
Int. Cl. F02k 1/02, 1/20, 3/04
U.S. Cl. 60—229 **6 Claims**



Fan air of turbo-fan engine flows through ducts which pass through wall of lobed thrust nozzle mounted on aft end of the engine so as to receive exhaust gas discharged therefrom, the ducts terminating within the nozzle and being spaced apart circumferentially thereof. Assembly may include a tubular ejector movable from position around nozzle to position downstream therefrom and provided with thrust reversing doors, or a pair of thrust reversing doors movable from position adjacent aft end of housing which surrounds the engine to position downstream from the nozzle.

3,696,618

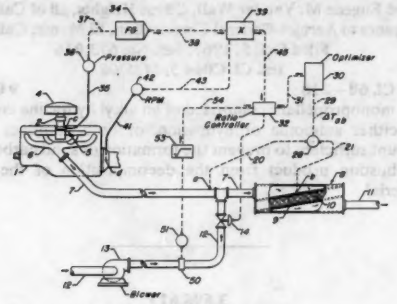
CONTROL SYSTEM FOR AN ENGINE SYSTEM

David M. Boyd, Clarendon Hills, and Clarence G. Gerhold, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed April 19, 1971, Ser. No. 135,199
Int. Cl. F02b 75/10
U.S. Cl. 60—276 **15 Claims**

A control system for an engine system which has means for optimizing the performance of the converter in the engine system by regulating a set point of a controller. In one embodiment, secondary air flow to the converter is the variable utilized to control the performance of the converter and is regu-

lated in response to the ratio of gas flow in respect to the engine of the system to secondary gas flow to the converter. In



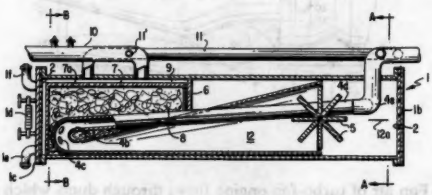
another embodiment the air to fuel ratio to the engine is utilized as a variable to control the performance of the converter.

3,696,619

ANTISMOG DEVICE FOR CLEANING, BURNING AND MUFFLING THE EXHAUST GASES AND ENGINE COMPARTMENT FUMES OF INTERNAL COMBUSTION ENGINES

Juan Rosa, 1835 Pedro Mendoza, Buenos Aires, Argentina

Filed July 23, 1970, Ser. No. 57,432
Int. Cl. F01n *3/14*
U.S. Cl. 60—297 **9 Claims**



An anti-smog device for cleaning and muffling exhaust gases and engine compartment vapors of internal combustion engines; comprising: a fume collecting funnel, a casing connected with the exhaust pipes of the engines; the casing being arrayed externally with a fluid level indicator, necessary inlet, outlet and conducting tubing, with an after burning ignition device suitably connected with the interior of the casing; where the internal structure mainly comprises a funnel shaped chamber, connected at the narrow end to a perforated tube with a return elbow, and faced by a multibladed impeller; further comprising a chamber filled with catalytic copper shavings, said chamber partially surrounding said perforated tube, the casing further being filled to about half of its narrowest width with a gas absorbing chemical solution.

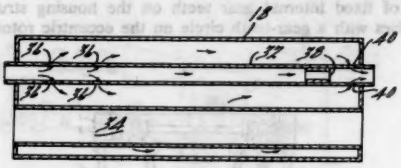
3,696,620

MARINE ENGINE WATER COOLING

John G. Pace, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed March 24, 1971, Ser. No. 127,619
Int. Cl. F01n *3/04*; F01p *3/12*
U.S. Cl. 60—321 **10 Claims**

Improved water jacketed manifolds and water cooling systems for marine engines wherein water circulation through



the manifold water jacket is provided through an apertured pipe which extends through the jacket.

3,696,621

METHOD OF SOIL STABILIZATION

Bernard B. Simms, Franklin Square; Alvin A. Stein, Brooklyn, both of N.Y., and Charles N. Larosa, Arnold, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 10, 1970, Ser. No. 62,684
Int. Cl. E02d *3/14*
U.S. Cl. 61—36 R **6 Claims**

In situ complexation of two water soluble polymer solutions is effected by alternately spraying the solutions on the soil to be stabilized. The first solution is a water solution of approximately 1–2 percent by weight of polyethylene oxide and is deposited to a loading of about 0.1 pound per square yard. The second solution is another water solution of approximately 10–20 percent of polyacrylic acid loaded to about 0.5 pound per square yard. Repetitive spraying will provide thicker stabilized surfaces.

3,696,622

A METHOD OF SOIL STABILIZATION AND LEAKAGE PREVENTION

Wataru Tohma, Yamato-Takada; Takao Murata, Yaizu; Nobutaka Nakamura, Fujieda, and Atsushi Kudo, Tokyo, all of Japan, assignors to Sumitomo Durez Company, Limited, Tokyo and Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 17, 1971, Ser. No. 116,207
Int. Cl. E02d *3/12*; E21b *33/13*
U.S. Cl. 61—36 R **6 Claims**

An improved method of soil stabilization and leakage prevention characterized by using a resin composition which comprises a water soluble strongly alkaline liquid phenol formaldehyde resin with a pH of 9.5 or more and having a molar ratio of phenol to formaldehyde between 1:1.5 and 1:3.0, and a lactone which is added in a proportion of 1 to 30 percent of the liquid resin, in which a compound such as urea, a urea derivative, a basic or neutral salt is used as a gelation control agent.

3,696,623

WOVEN MAT

Olaf Heine, Kelkheim/Taunus, and Gerhard Knisse, Wohltorf, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 843,518, July 22, 1969, abandoned. This application June 29, 1971, Ser. No. 158,036
Claims priority, application Germany, July 30, 1968, P 17 84 360.6
Int. Cl. E02b *3/12*
U.S. Cl. 61—38 **11 Claims**

An assembly for preventing erosion of sand and pebbles from shores, beaches, waterways and the like. The assembly includes an outer mat made from a thermoplastic material.

The mat has an open net weave and includes several compartments which are adjacent one another. A plurality of open net weave bags, also made of thermoplastic material, and filled

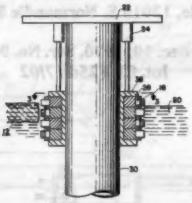
with entangled ribbons of thermoplastic material are inserted into the compartments of the mat. The assembled mat may be attached to the shore.

3,696,624

BUCKET WHEEL ICE CUTTER

John D. Bennett, Denton, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Oct. 2, 1970, Ser. No. 77,508
Int. Cl. E02b *17/00*; B63b *35/12*
U.S. Cl. 61—46 **5 Claims**



Bucket wheels are mounted on offshore platforms or ship prows for cutting ice sheets found in frigid waters. The bucket wheels rotate in a generally horizontal plane and are paired in opposite directions so that a torque is not placed on the structure or ship. Multiple sets of bucket wheels can be used to cut a thick section of ice and/or the bucket wheels can be inclined or arranged to oscillate up and down to cut a larger vertical section.

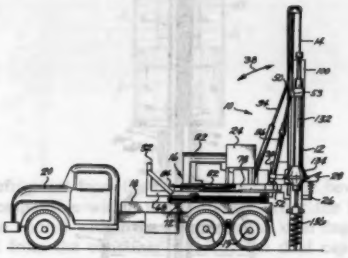
3,696,625

POST IMPLANTING METHOD AND VEHICULAR APPARATUS THEREFOR

James M. Alexander, Kent, Wash., assignor to Stillwell-Gerard Construction Co., Bellevue, Wash.

Filed March 12, 1971, Ser. No. 123,532
Int. Cl. E02d *7/02*; E21c *11/02*
U.S. Cl. 61—53.5 **20 Claims**

A port hole boring auger and a drop weight hammer are mounted on the periphery of a carriage a fixed distance apart. The carriage is rotatably and slidably mounted on a transport vehicle adapted to be driven along a surveyed post line by an operator seated at a control console including a plurality of control valves allowing the operator to also position and operate the auger and hammer. The carriage may be rotated to position the auger and hammer laterally of the transport vehicle such that the vertical center lines of the auger and hammer define a substantially vertical plane which extends generally in the direction of transport vehicle movement along the surveyed line. The hole boring auger is centered on a post position mark on said line such that the hammer is substantially centered over a previously bored hole at an adjacent post position mark. A hole is bored at the post position mark while at substantially the same time a post is hammered in place in the previously bored hole. The transport vehicle is



moved ahead so that the auger is centered over the next adjacent post position mark and the hole boring and post implanting is repeated.

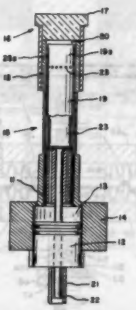
A method of implanting posts along a surveyed line including the steps of boring a post hole at one post position mark on said line and implanting a post in a previously bored hole at a rearwardly adjacent post position mark on said line with a single positioning of said transport vehicle.

3,696,626

CRYOGENIC REFRIGERATION DEVICE

Alexander Daniels, Briarcliff Manor, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,542
Int. Cl. F25b *9/00*
U.S. Cl. 62—6 **10 Claims**



A thermodynamic, regenerative-cycle refrigerating device including a compression space, a cooler, a regenerator and a cold finger formed as a cylinder with a displacer movable therein for defining an expansion space, the cold produced being transferred from the expansion space primarily through a thin cap at the end of the cylinder.

3,696,627

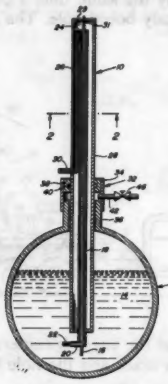
LIQUID CRYOGEN TRANSFER SYSTEM

Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 18, 1971, Ser. No. 107,105
Int. Cl. F17c *7/02*
U.S. Cl. 62—51 **8 Claims**

A system for transferring a cryogenic liquid from a storage vessel to a remote point of use at a constant temperature, pres-

sure and flow rate wherein the transfer tube is jacketed with a second tube along substantially its entire length and these tubes are enclosed in an evacuated jacket. Use of a nozzle in the second tube entry end causes the liquid entering the jacket to decrease in pressure and temperature thereby subcooling



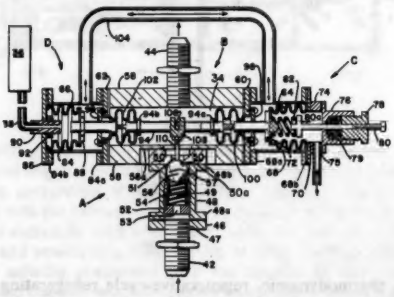
the liquid in the transfer tube to prevent said liquid from boiling. The jacketing fluid absorbs heat entering the transfer system from the atmosphere. Included in the system as accessories are an adaptor for attaching the system to the storage vessel in pressure tight relationship and flow control on the delivery end of the system.

3,696,628

THERMOSTATIC EXPANSION VALVE FOR REFRIGERATION SYSTEM

Roy M. Coyle, Sr., Glen Ellen, Calif., assignor to Norman J. Wray, Glen Ellen, Calif., a part interest

Filed Aug. 19, 1971, Ser. No. 173,211
Int. Cl. F25b *41/04*
U.S. Cl. 62—115 **11 Claims**



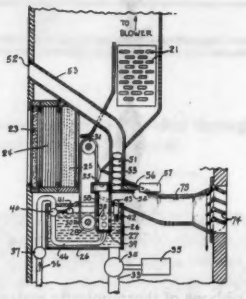
A thermostatic expansion valve for use in a refrigeration system of the vapor-compression type. Valve actuation is made responsive to the combined effect of evaporator coil temperature and pressure as independently monitored through separate control inputs. A slotted ball is pivotally rotated in its seat in a direction determined by the net pressure differential applied to the control inputs to present a gradually and uniformly varying flow orifice profile. One control input monitors internal coil pressure directly while the other control input senses the gas pressure produced within a thermostatic bulb in contact with the coil exterior. Calibration means are provided to balance the net pressure differential under desired steady-state cooling conditions and position the valve accordingly.

3,696,629

AIR CONDITIONING SYSTEM

Russell G. Heston, Jr., Little Silver, N.J., assignor to Donald Deskey, Palm Beach, Fla.

Filed April 12, 1971, Ser. No. 133,073
Int. Cl. G01k *13/00*
U.S. Cl. 62—129 **10 Claims**



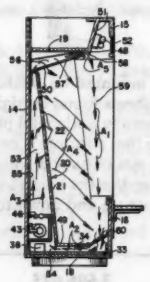
An air conditioning system including the usual air heating and air cooling means, blowers, electrical controls and the addition of a means for removing sulfur oxide compounds from the air. The sulfur oxide compounds are media removed by forcing the air through a fabric or belt wetted with an alkaline hydroxide water solution. Automatic means replenish the hydroxide solution when it is exhaused.

3,696,630

HUMIDIFIED AND REFRIGERATED SHOWCASE

Tony J. Bressickello, 13015 S. Normandie Boulvard, Gardena, Calif.

Filed Dec. 10, 1970, Ser. No. 96,943
Int. Cl. F25d *17/02*
U.S. Cl. 62—188 **13 Claims**



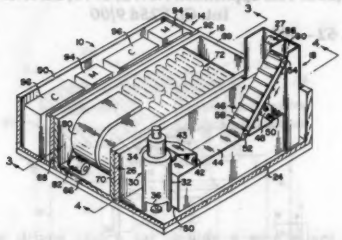
A showcase for displaying and preserving flowers has a housing formed with a front access opening and an enclosure installed within the housing. An air flow path through which air may be recirculated is in part constituted by a space defined between the housing and enclosure. A refrigerating unit includes a refrigerant conduit oriented in the air flow passage and above a water pan located on the bottom of the housing. A blower mounted adjacent the refrigerant conduit operates to pull recirculating air across the water to collect moisture ad become humidified to the desired degree. Thereafter the air is forced in heat exchange relationship around the refrigerant coil and upwardly through the air flow path for distribution through perforations formed in the enclosure and into contact with the flowers.

3,696,631

INTEGRATED MODULAR REFRIGERATION SYSTEM

Pelayo F. Valdes, 4504 W. Idelwild, Tampa, Fla.

Filed Dec. 9, 1970, Ser. No. 96,483
Int. Cl. F25d 21/10
U.S. Cl. 62—282 12 Claims



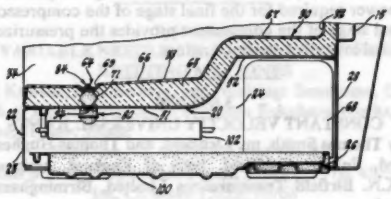
This device relates to a modular refrigeration apparatus which is adapted to be attached to the deck of a fishing vessel and to not only quick freeze the comestibles placed within but to keep the hold at a low temperature. The apparatus consists of three separate modules which may be used remotely from each other.

3,696,632

DEFROST WATER DRAIN TRAP

Ralph E. Carlin, and Ralph R. Rigg, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed March 8, 1971, Ser. No. 121,799
Int. Cl. F25d 21/14
U.S. Cl. 62—285 4 Claims



A refrigerator cabinet defrost water drain trap positioned in the bottom wall of the front opening cabinet which provides a liquid trap in the form of a cup-shaped container designed to receive the lower discharge end of a drain tube. The container encloses the lower end of the drain tube such that the container's free overflow edge determining liquid level is positioned a defined distance above the discharge end of the drain tube whereby the liquid in the container provides a hydraulic suction head which normally seals the drain tube against entry of outside air into the cabinet. The differential movement of the liquid levels provides a momentary vacuum release air passage through the drain tube to permit the entrance of a limited quantity of outside air into the compartment whereby substantial equalization of pressures between the interior and exterior of the cabinet is achieved to allow the cabinet door to be reopened immediately with greater ease after closing.

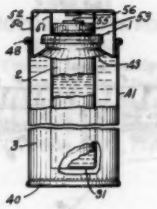
3,696,633

CONTAINER COOLING DEVICE

Evan D. Mills, 507 Sourth Catalina Street, Los Angeles, Calif.

Filed Dec. 21, 1970, Ser. No. 100,138
Int. Cl. F25d 3/10
U.S. Cl. 62—294 5 Claims

A container for beverages and other comestibles is provided with refrigerating means comprising a refrigerant cartridge within the container and held in position therein by a dual cap which is detachably secured to the container and fixedly secured to the refrigerant cartridge. The refrigerant cartridge holds a vapor phase refrigerant of low boiling point. Means is provided for puncturing the dual cap to release the vapor



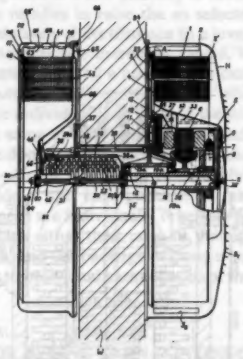
phase refrigerant from the cartridge to cool the beverage or other compestible within the container. After the beverage has been cooled within the container the dual cap may be released from the container whereby the dual cap and the refrigerant cartridge may be removed from the container.

3,696,634

DEMOUNTABLE HEAT PUMP WITH HERMETICALLY SEALED CIRCUIT

Ludwig Ludin, Aargau, Switzerland, and Nikolaus Laing, Hofener Weg 35-37, Germany, assignors to Physikalisch-Technisches Entwicklungsburo Laing, Aldingen b. Stuttgart, Germany

Filed June 1, 1970, Ser. No. 42,018
Claims priority, application Switzerland, May 30, 1969, 8321/69
Int. Cl. F25d 17/00
U.S. Cl. 62—333 9 Claims



A heat pump having a rotary air-flow-inducting heat exchanger, e.g., mounted on an exterior wall of a space whose temperature is to be controlled, forming a heat-pump circulation path with a further heat exchanger and a compressor. The latter is motor driven and is coupled with at least one of the heat exchangers via a magnetic drive operating through a magnetically permeable wall.

3,696,635

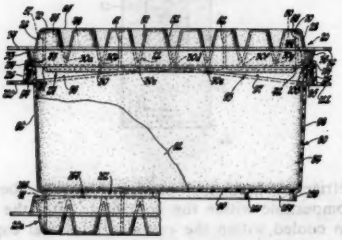
EJECTING RECEPTACLE FOR PLASTIC ICE TRAY

Thomas H. Fogt, West Carrollton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed April 12, 1971, Ser. No. 133,271
Int. Cl. F25c 5/18
U.S. Cl. 62—344 4 Claims

A box-like ice block collecting receptacle and flexible multiple compartment freezing tray combination which allows the

tray with its frozen contents to be inverted and supported on the receptacle by means of cooperating raised support surfaces arranged intermediate each of the side and end walls adjacent its upper open end. The tray is supported in a horizontal manner whereby either pair of unsupported diagonally opposed tray corners can be flexed downwardly out of a horizontal plane for twisting the tray and distorting the compartments to harvest ice cubes into the container. The container additionally provides for the tray to be nested in an upright or inverted position on the storage container in lid-like fashion.



3,696,636

METHOD AND APPARATUS FOR COOLING LIQUIDS

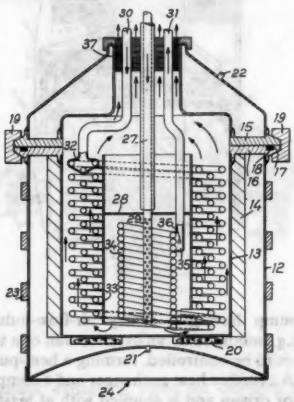
Gaston M. Mille, 9,bd Lord-Duveen, 13 Marseille, 8e, France

Filed April 14, 1969, Ser. No. 815,991

Claims priority, application France, Feb. 21, 1969, 6922190

Int. Cl. B67d 5/62

U.S. Cl. 62—399 **3 Claims**



A process for cooling a fluid circulating in contact with one face of a heat exchange wall, by cooling the other face of the wall with a cryogenic liquid sprayed under pressure and by means of residual gases resulting from the evaporation of this liquid. An exchanger for carrying out this process includes a tube placed in a heat-insulated enclosure, in which circulates a fluid to be cooled and on the walls of which a cryogenic liquid is sprayed. The exchanger includes means for placing a cryogenic liquid under pressure and a flow-regulating valve in the pressure line controlled by a thermostat located at the exchanger outlet.

3,696,637

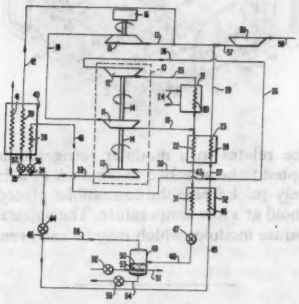
METHOD AND APPARATUS FOR PRODUCING REFRIGERATION

Leif A. Ness, Macungie, and Edmund P. Thomas, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 752,998, Aug. 15, 1968, Pat. No. 3,657,898. This application Nov. 2, 1971, Ser. No. 194,856

Int. Cl. F25d 9/00

U.S. Cl. 62—402 **10 Claims**



Refrigeration system including a multi-stage compressor and two work expansion engines of the turbine type with the impellers of the expansion engines and the impeller of the final stage of the compressor being mounted on a common shaft. The work developed in the expansion engines provides the total power required for the final stage of the compressor and the final stage of the compressor provides the pressurized gas expanded in both expansion engines.

3,696,638

CONSTANT VELOCITY UNIVERSAL JOINTS

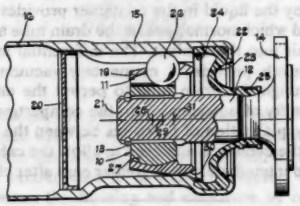
Henry Thomas Smith, nr. Lichfield, and Thomas Hughes Millward, Sutton, Coldfield, both of England, assignors to G.K.N. Birfield Transmissions Limited, Birmingham, England

Filed Sept. 9, 1970, Ser. No. 70,868

Claims priority, application Great Britain, Sept. 9, 1969, 44,513/69

Int. Cl. F16d 3/30

U.S. Cl. 64—21 **4 Claims**



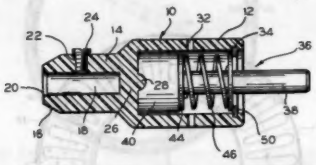
A constant velocity universal joint including an inner member and an outer member with torque-transmitting balls therebetween has the outer member thereof constituted by an increased wall-thickness end portion of a tube, the end portion being shaped to provide the ball tracks.

3,696,639

CLUTCH FOR USE IN THE PLUMBING FIELD

William C. Gore, Elgin, and Eugene B. Shapiro, Highland Park, both of Ill., assignors to Beatrice Foods Company, thru its division Chicago Specialty Manufacturing Co., Skokie, Ill.

Filed Feb. 8, 1971, Ser. No. 113,139
Int. Cl. F16d 7/00
U.S. Cl. 64—29 3 Claims



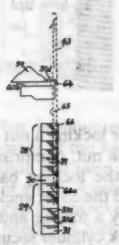
A power driven clutch for driving a wire auger, blade, screwdriver bit, socket wrench, and the like, which clutch may be molded of plastic and which comprises a carrier or driven member, a driver which may be connected to an electric power source such as an electric drill motor, and where the driver has means for engaging a member on the carrier or driven member to operate said carrier or driven member for rotation, and wherein the driver is rotatable with respect to the carrier and is axially movable with respect to the carrier. The driver when in positive engagement with the carrier member is adapted to rotate said carrier member, and the driver adapted when the object to be rotated and carried by the carrier member strikes an obstruction which impedes or prevents its rotation will operate to cause the driver to move axially with respect to the carrier so that the driver may continue to rotate without imparting a corresponding rotation to the carrier or driven member.

3,696,640

VARIABLE NEEDLE SELECTING MEANS FOR KNITTING MACHINES

Shinji Kawase, Nishinomiya, and Norishige Sumitomo, Osaka, both of Japan, assignors to Precision Fukuhara Works, Ltd., Kobe, Hyogo, Japan

Filed Jan. 12, 1971, Ser. No. 105,838
Claims priority, application Japan, Jan. 21, 1970, 45/5577
Int. Cl. D04b 15/32, 15/68
U.S. Cl. 66—40 3 Claims



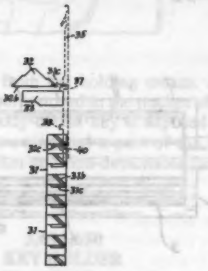
Needle selecting means for the raising of selected needles of multi-feed circular knitting machines which includes, at each feed of the machine, a first plurality of vertically aligned separate level raise cams comprising a first group thereof and a second plurality of vertically aligned separate level raise cams comprising a second group thereof. The cams of the first group thereof act upon butts disposed at a like first plurality of levels on a first or upper portion of jack extensions of the needles and the cams of the second group thereof act upon butts disposed at a like second plurality of levels on a second or lower portion of the jack extensions of the needles. The two groups of cams are interchangeably moved into and out of needle raising position under the control of pattern mechanism of the machine whereby each of two individual patterns may be accordingly interchangeably placed in the fabric being made on the machine.

3,696,641

NEEDLE SELECTING MEANS FOR KNITTING MACHINES

Norishige Sumitomo, Osaka, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Kyogo, Japan

Filed Jan. 12, 1971, Ser. No. 105,837
Claims priority, application Japan, Jan. 21, 1970, 45/5576
Int. Cl. D04b 15/32, 15/68
U.S. Cl. 66—40 5 Claims



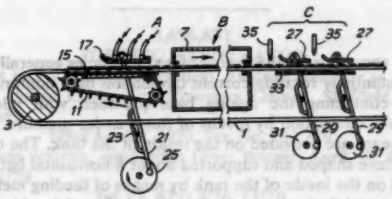
Needle selecting means for the raising of selected needles of multi-feed circular knitting machines from welt to latch clearing levels in two steps and for the retention of non-raised needles at welt level which includes, at each feed of the machine, a plurality of vertically aligned separate level raise and guard cams of which the raise cams act upon selected ones of individual butts disposed at a like plurality of levels on jack-like extensions of the needles to raise the so selected needles, in the first step, a relatively short distance to a level at which the partially raised needles are thereafter raised, in the second step, to latch clearing level by a needle raise cam acting upon common level butts on the needles, and of which the guard cams act upon the individual jack butts of the non-raised needles to retain the same at welt level. A raise and a guard cam are formed at the opposite end faces of a cam block and a like plurality of aligned cam blocks are releaseably secured in a housing to provide a unit cam package of raise and guard cams, the cam blocks are individually reversely positionable in the housing to place either their raise or their guard cams in operative position, and the package of cams is removeably attachable as a unit to individual cam sections of the machine.

3,696,642

PLANT FOR DYEING YARN CONTINUOUSLY

Fernando Rigacci, 10 Via Castelnuovo, Prato, Florence, Italy

Filed Dec. 22, 1970, Ser. No. 100,671
Claims priority, application Italy, Dec. 23, 1969, 4904 A/69
Int. Cl. B05c 3/138
U.S. Cl. 68—5 D 3 Claims



A plant for dyeing yarn discontinuously includes a perforate conveyor the upper run of which extends through a zone at

which yarn is deposited in skeins or in continuous zig-zag formation, a zone in which dye is applied, a zone in which the dye is fixed by heating, a washing zone and a drying zone in which the yarn is alternately squeezed and expanded.

3,696,643

DEVICE FOR TREATING LONG FLAT TEXTILE MATERIALS

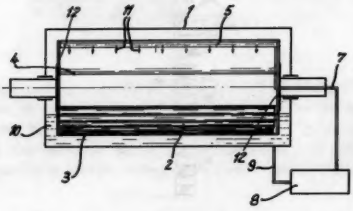
Manfred Schuierer, Erbach/Odenweld, Germany, assignor to Bruckner-Apparatebau Michelstadt GmbH, Erbacham Odenwald, Germany

Filed Jan. 18, 1971, Ser. No. 107,318

Claims priority, application Germany, Jan. 20, 1970, P 20 02 357.8

Int. Cl. D06f *37/06, 37/08, 39/08*

U.S. Cl. 68—5 B **3 Claims**



Device for treating long flat textile materials utilizing rotating drum with apertures distributed over length of drum for passage of fluid and with at least one radial rib whose height is 20–25 percent of the drum diameter.

3,696,644

TEXTILE ARTICLE DYEING APPARATUS

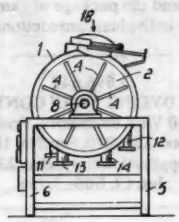
Manfred Blumenkamp, Via Bissolati 6, Cremona, Italy

Filed June 10, 1971, Ser. No. 151,700

Claims priority, application Italy, June 16, 1970, 26070 A/70

Int. Cl. D06f *17/02, 39/04, 39/14*

U.S. Cl. 68—15 **7 Claims**



An apparatus for the dyeing of textile articles generally with a substantially rotating current circulation bath comprising a tank containing the dyeing bath provided with inlets to provoke circulation by means of fluids under pressure. Heating means are provided on the inside of the tank. The tank is autoclave shaped and supported about a horizontal bath provided on the inside of the tank by means of feeding means. A closing seal device is provided on an opening of the skirt of the tank for the loading and unloading of materials respectively to be treated and materials already treated.

3,696,645

APPARATUS FOR LIQUID TREATMENT OF TEXTILE MATERIALS OF STRING FORM

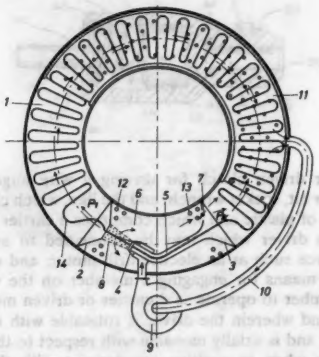
Erik Henningsen, Vaerlose, Denmark, and Hans Borge Nielsen, Reinach, Switzerland, assignors to Vald Henriksen A/S, Soborg, Denmark

Filed April 16, 1971, Ser. No. 134,695

Claims priority, application Denmark, April 17, 1970, 1953

Int. Cl. B05c *3/134*

U.S. Cl. 68—177 **6 Claims**



An apparatus for liquid treatment of textile materials in string form in which the textile material is transported by the flowing liquid through a wide channel and a narrow channel along a horizontal or slightly inclined annular path with constant radius of curvature.

3,696,646

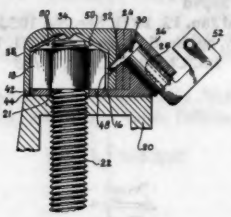
NUT LOCK

Nicholas R. Loscalzo, 3 Woodmont Road, Melville, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,825

Int. Cl. F16b *41/00;* **E05b** *73/00*

U.S. Cl. 70—1.5 **3 Claims**



A locking device for locking a nut onto its bolt to resist unwanted removal of the nut, comprising a locking base and a securable cover for the locking base. The locking base is secured by the nut and the cover encloses the nut and is joined to the locking base by a tongue and groove joint. A locking bolt operated by a lock cylinder secures the cover to the base. V-shaped projections angled toward the nut on the inside of the cover cut and jam the nut onto the bolt under extraordinary force such as a hammer blow.

3,696,647

CABLE-TYPE LOCK ASSEMBLY

Stanley C. Balicki, 2834 Commerce Street, Franklin Park, Ill.

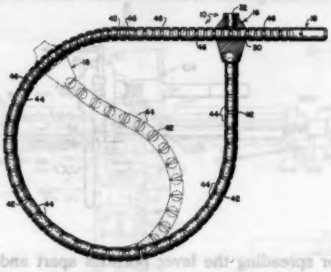
Filed Oct. 9, 1970, Ser. No. 79,435

Int. Cl. E05b *15/16, 67/06*

U.S. Cl. 70—49 **7 Claims**

A cable-type lock assembly in the form of an indestructible elongated armored cable having a loop-forming lock housing

at one end through which the other end of the cable may be passed so that the lock housing functions as an overlap slip joint and provides a closed retaining loop. By progressively pulling the cable through the locking housing, the loop may be



shrunk to a required size while a key operated cylinder lock which is associated with the lock housing functions to retain the latter at selected positions along the free end region of the cable and establish the position of the overlap.

3,696,648

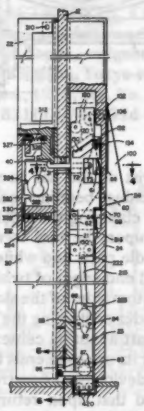
PANIC LOCK FOR A DOOR

William J. Horgan, Jr., Allegheny County, Pa., assignor to Blumcraft, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 875,229, Nov. 10, 1969, and a continuation-in-part of Ser. No. 87,717, Nov. 9, 1970, Pat. No. 3,633,389. This application Dec. 11, 1970, Ser. No. 97,102

Int. Cl. E05b *65/10*

U.S. Cl. 70—92 **7 Claims**



A pivotally mounted bar is mounted on the inside of a locked door. Upon movement of the bar a lever is pivoted to actuate a cam actuated slide and raise a lock bolt to unlock the door without the use of a key. A crossover link provides a means whereby the door can be unlocked from the other side by means of pulling on a handle. A lock is provided to render inoperable the handle portion of the device. A means is provided for retaining the lock bolt in the raised position while the door is swung open.

3,696,649

KEY CASE

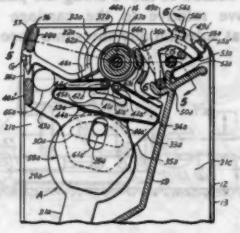
Ho Chow, and Junlin Wong Chow, both of 31 Coles Court, River Edge, N.J.

Filed March 1, 1971, Ser. No. 119,544

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 R **14 Claims**

A convenient key case having one or more pockets structured to have a non-removable but rotatable holding means for each pocket to hold a key having a head and a body and to move a desired key to a load, store or use position. An adaptor is adhered to the head of the key to maintain a desired relationship with the holding means disregarding the shape of the head. At the load position the key is easily and quickly inserted in or removed from the holding means. At the store position the key is properly stored in the pocket of the case. At the use position the body of the key is exposed at a proper position with ability to swing and a part of the head always remains inside the pocket and non-detachable from the holding means.



3,696,650

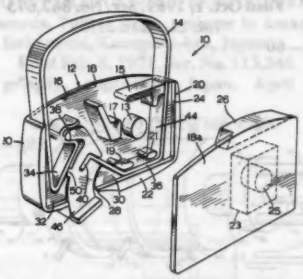
KEY HOLDER

Donald A. Hillis, 27 Kingslake Road, Willowdale, Ontario, Canada

Filed Feb. 22, 1971, Ser. No. 117,279

Int. Cl. A47g *29/10*

U.S. Cl. 70—457 **8 Claims**



A key holder consisting of a housing, having a locking chamber formed therein, and a key strap in the form of the resilient flexible strip of spring steel mounted with both ends thereof adapted to be located in the housing in the locking engagement. The holder also includes a manually engageable actuator means connected to one end of the flexible strap, and adapted to lock in engagement with the other end of the flexible strap in the housing. The actuator means is manually engageable to release the locked end of the strap so that it may be removed from the housing to permit keys to be mounted on or removed from the outwardly projecting portion of the strap.

3,696,651

FORGING MANIPULATOR

Robert Henry Harrison, Sheffield, England, assignor to Davy and United Engineering Company Limited, Sheffield, England

Filed April 9, 1971, Ser. No. 132,719

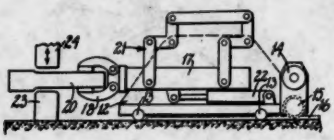
Claims priority, application Great Britain, April 30, 1970, 20,761/70

Int. Cl. B21j *7/26, 13/10*

U.S. Cl. 72—22 **7 Claims**

A manipulator for supporting and maneuvering a workpiece while operated on by a forging press has a carriage which

moves along a prescribed path, means for driving the carriage along the path, a peel which supports the workpiece and which is mounted on the carriage for movement relative to the carriage in a direction parallel to the path, and actuating means for driving the peel relative to the carriage. During at least part of the time when the workpiece is held by the forge, the carriage is caused to move along the path, the peel being caused to move relative to the carriage in the opposite direction and at substantially the same speed. On release of



the workpiece by the forging press, the peel is driven by the actuating means in order to be restored to a datum position relative to the carriage. During this re-positioning movement of the peel, there is applied to the carriage a force in the same direction as, and substantially the same magnitude as, the force applied by the peel by the actuating means, in order that the movement of the carriage shall be unaffected by the reaction force applied in the opposite direction by the actuating means to the carriage.

3,696,652

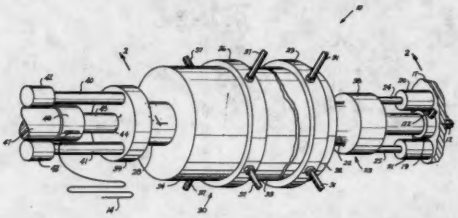
CONTINUOUS MATERIAL DEFORMATION PROCESS AND APPARATUS THEREFOR

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,673

Int. Cl. B21d *23/08*

U.S. Cl. 72—60 **64 Claims**



A process and apparatus for practicing the process wherein a workpiece of indefinite length, e.g., a metal rod, is continuously deformed by a deforming agency to produce a product of indefinite length, e.g., wire. The continuity of the deformation is achieved by intermittently advancing the workpiece into the deforming agency, e.g., a controlled flow of pressurized fluid or a conventional extrusion die, intermittently advancing the deforming agency over the workpiece, and controlling the intermittent advances of the workpiece and the deforming agency to maintain a desired relative velocity between the workpiece and the deforming agency. Also disclosed is a novel workpiece clamping apparatus wherein a segmented cylinder is used as a clamping device for gripping a workpiece.

3,696,653

SILL CLAMP FOR AUTOMOBILES

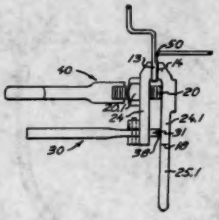
William Mojelski, Grand Forks, British Columbia, Canada, assignor to Mo Clamp Co. Ltd., Delta, B.C., Canada

Filed June 4, 1970, Ser. No. 43,336

Int. Cl. B21d *11/04, 1/14*

U.S. Cl. 72—296 **4 Claims**

A sill clamp for attachment to a sill of an automobile body, the clamp having a pair of clamping parts connected for relative rocking and slideable movement, and having complementary jaws and lever portions. One of the parts having a cam movable into engagement with a lever portion of the other



part for spreading the lever portions apart and moving the jaws together. Means are provided on the parts for attachment of tensioning devices for straightening the automobile body.

3,696,654

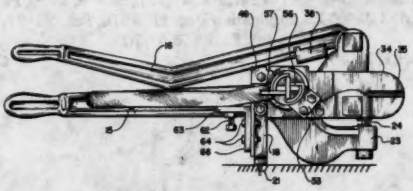
BAND IRON STOCK WORKING TOOL WITH A TWIST DEVICE THEREON

Karl A. Bohn, 109-16 222nd Street, Queens Village, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,379

Int. Cl. B21d *11/14, 9/08*

U.S. Cl. 72—299 **6 Claims**



A band metal twist device has been provided for a composite cutting, punching, bending tool in which parts of the tool are utilized for clamping the stock and wherein the twist device is mounted upon the tool to receive the stock piece between clamp handle parts and while being clamped having opposingly arranged end edges of twist key portions engageable with top and bottom sides of the stock piece to effect upon rotation of the cylinder containing the key portions by its handle to twist stock part about its center portion and provide a twist therein so that its opposite ends lie at right angles to one another. The twist device is so constructed and the twist key portion so arranged that upon return rotation of the twist cylinder containing the key portions the twisted portion of the band stock piece can be laterally removed through the twist device from the work tool upon the handle clamp parts being released without disassembling the twist device. Adjustment means is provided upon the work tool engagement by the handle of the twist device to limit the turning movement of the handle depending upon the springiness of the band stock material.

3,696,655

APPARATUS FOR MAKING BLADES

William L. Hinks, and Harry L. Hosterman, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

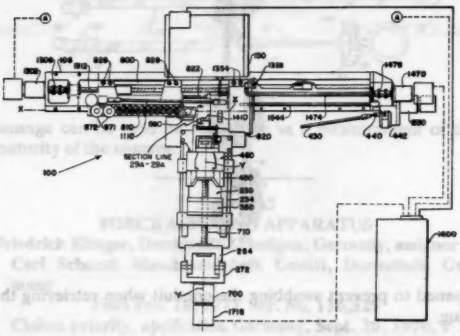
Division of Ser. No. 744,120, July 11, 1968, Pat. No. 3,581,535. This application Feb. 16, 1971, Ser. No. 115,266

Int. Cl. B21d *11/04*; B21b *37/14*; B21d *9/05*

U.S. Cl. 72—321 **9 Claims**

Method and apparatus for making blades for use in tire molds by piercing, notching, bending or otherwise altering

shape of a free end of strip material by successively positioning the free end and a plurality of shape altering tools in operative engagement and cutting off a so-formed blade from the free end. Apparatus includes an automated machine tool having five axes of control and means for storing and for communicating command signals to each axis. Successive different blade configurations are made without revision of shaping tools. The strip, held by jaws, may be bent up or down in successive bends by a rotating bending device. A rotatable punch and die set is included.



3,696,656

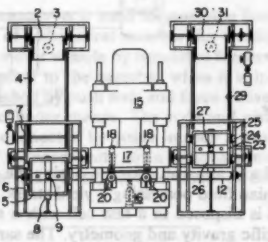
APPARATUS FOR CARRYING AND STRAIGHTENING ELECTROLYTIC ANODE PLATES TO BE INSTALLED IN AN ELECTROLYTIC CELL

Kizo Nara, Osaka; Izumi Sukekawa, Tokyo, and Yasuo Yamada, Osaka, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 1, 1970, Ser. No. 42,028

Int. Cl. B21j *13/10*; B21d *43/10*

U.S. Cl. 72—420 **6 Claims**



An apparatus for conveying, at regular intervals, electrolytic anode plates and installing them at regular intervals in an electrolytic cell, comprises a feed-in section, a device for straightening said anode plates by pressing or hammering each of said anode plates thereby to remove camber, torsion, and casting fins from the anode plates, and a feed-out section.

3,696,657

METAL WORKING CRANK AND SLIDE PRESS MECHANISM

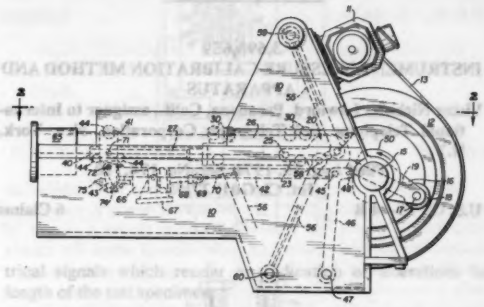
John Hardy Maytag, Denver, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Filed Nov. 19, 1970, Ser. No. 91,020

Int. Cl. B21j *9/18*

U.S. Cl. 72—450 **15 Claims**

A metal working crank and slide press mechanism for reciprocating parallel members, for example, a carriage-mounted ram and a sleeve slidable on the ram. The press mechanism is arranged to resist heavy side pressure exerted upon the connecting rod which assumes extremely angular positions relatively to the carriage. A cross head and side thrust resisting levers produce a straight line motion by translating the thrust of the connecting rod into a direction in line with the travel of the ram-carrying carriage connected to the cross head. The carriage is mounted on wheels running on the top and bottom of hardened way strips, the wheels being adjustably mounted on eccentric axles to grip the ways with a predetermined amount of pre-load to prevent slack in the wheels. The working surfaces of the wheels and way strips extend radially with respect to the center of mass of the carriage assembly to minimize the effect of thermal expansion on the wheel pre-load.



3,696,658

JIG APPARATUS FOR A BENDING PRESS

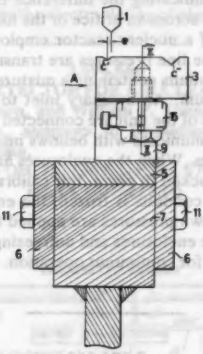
Teruma Hamada, Tokyo, Japan, assignor to Amada Company Limited, Isehara-shi, Kanagawa-ken, Japan

Filed Feb. 8, 1971, Ser. No. 113,346

Claims priority, application Japan, April 28, 1970, 45/35881

Int. Cl. B21d *37/04*; F16b *43/00*

U.S. Cl. 72—481 **1 Claim**



For use with a bending press, a jig apparatus of relatively simple design for setting a lower die in complete alignment with an upper head. The apparatus includes a die holding member having recessed grooves of the shape of the letter Ω (omega) turned up side down, and semi-cylindrical members suitably shaped to fit into the recessed grooves. The semi-cylindrical member is urged to the inner surface of the recessed groove by a bolt threaded into the bottom of the lower die, but with the pressure limited by the collar inserted between the bolt head and the lower die. With this limited pressure, the lower die is preliminarily set, yet it is still movable, for example, by a hammering action. After further fine ad-

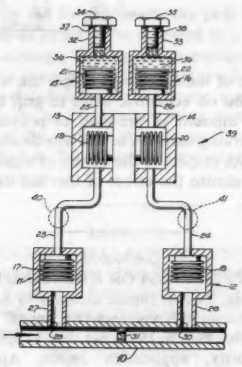
justment, the lower die is solidly fixed to the holding member, for which purpose, a means is provided to forcibly deform the semi-cylindrical member within the confinement of the recessed groove, preventing further movement of the semi-cylindrical member and of the lower die relative to the die holding member.

3,696,659

INSTRUMENT PRESSURE CALIBRATION METHOD AND APPARATUS

Victor Nicholas Lawford, Pasadena, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,710
Int. Cl. G01l 27/00
U.S. Cl. 73—4 R 6 Claims



A method of and apparatus for calibrating a differential pressure unit for indicating the difference between the pressures at two points across an orifice or the like in a liquid sodium cooling line of a nuclear reactor employed in producing electric power. The line pressures are transmitted to the unit by a first set of conduits containing a mixture of liquid sodium and liquid potassium. An auxiliary inlet to each of the two pressure chambers of the unit are connected to a second set of conduits that communicate with bellows inside of two sealed, oil filled enclosures. When the enclosures are sealed, the bellows therein are locked in place. For calibration, the mixture in the first set of conduits is frozen, the enclosure seals are removed, and known pressures are applied to the enclosures. After resealing the enclosures and unfreezing the mixture, the unit is again ready for continuous operation.

3,696,660

LOCATING HOLES IN TUBING

Glenn O. Hubbard, deceased, late of Andrews, Tex. (Claudia M. Hubbard, executrix)

Filed March 2, 1970, Ser. No. 15,572
Int. Cl. G01m 3/02
U.S. Cl. 73—40.5 R 6 Claims

Leaks in underground conduit, such as vertical drill pipe in wells or underground pipelines, are located by closing one end of a segment of the conduit and then pumping a plug into the pipeline. As long as fluid is escaping from the conduit through the leak, the plug will move, but when the plug passes the leak, the plug will no longer move because of the fluid trapped between the plug and the closure. Then the plug can be located by a wire line attached to the plug. If the plug is to be retrieved by pulling the plug, a passageway through the plug is

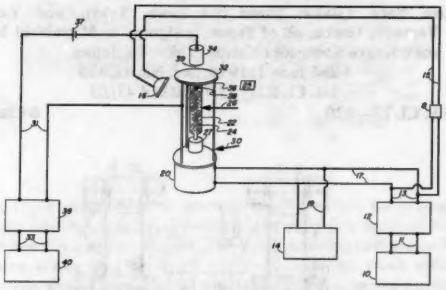
opened to prevent swabbing the conduit when retrieving the plug.

3,696,661

METHOD AND APPARATUS FOR MEASURING THE YIELD STRESS OF NON-NEWTONIAN FLUIDS

Arthur R. Garabrant; Alan Beerbower, both of Westfield, and James A. Wilson, Stanhope, all of N.J., assignors to Esso Research and Engineering Company

Filed Dec. 11, 1969, Ser. No. 884,138
Int. Cl. G01n 29/00, 11/10
U.S. Cl. 73—54 22 Claims



A method and apparatus for measuring the yield stress of a non-Newtonian fluid possessing a yield stress. A small sample of the fluid is disposed in a test cell with a solid particle of known specific gravity and geometry. The sample is vibrated by an electronic means so as to generate an alternating, asymmetric displacing force; and, at the first displacement of the particle, the amplitude and frequency of the vibrations is electronically measured. The yield stress is determined as a function of the amplitude and frequency of the vibration at the time of initial displacement.

3,696,662

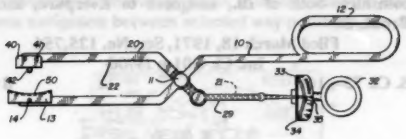
SAUSAGE MATURITY MEASURING DEVICE

Thomas R. Foltz, Clarendon Hills; Gerald R. Hegarty, Schiller Park; Ervin W. Hopkins, Hinsdale, and Joseph C. Wilcox, Wheaton, all of Ill., assignors to Armour and Company, Chicago, Ill.

Filed April 9, 1969, Ser. No. 814,785
Int. Cl. G01n 3/48, 3/08
U.S. Cl. 73—81 6 Claims

Moveable elements having jaws are connected in plier form, one of the jaws having a hemispherical projection, and one of the elements communicating with a force measuring gauge. A

sausage can be gripped between the jaws and the force required to impress the hemispherical projection into the



sausage can be read on the gauge as a measurement of the maturity of the sausage.

3,696,663

FORCE APPLYING APPARATUS

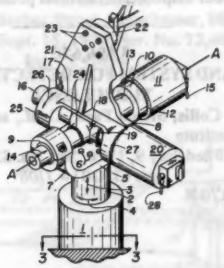
Friedrich Klinger, Darmstadt-Arheilgen, Germany, assignor to Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany

Filed Feb. 18, 1971, Ser. No. 116,529

Claims priority, application Germany, Sept. 30, 1970, P 20 48 050.6

Int. Cl. G01n *3/00*

U.S. Cl. 73—91 **10 Claims**



The present apparatus is used for applying forces substantially to a point of a structural member, for example, for testing an axle of a motor vehicle by simulated forces corresponding to those applied to the member when it is in actual use. This is accomplished by push rods and force delivering means, such as piston cylinder means. The rods and piston cylinder means are interconnected by yokes in such a way that forces may be applied independently or in various combinations in the three spatial directions, to said point of the structural member.

3,696,664

TORSIONAL OSCILLATOR

Kurt Moser, Fribourg, and Beat Hochli, Bern, both of Switzerland, assignors to Lonza, Ltd., Gampel (Valais) (Direction Basel), Switzerland

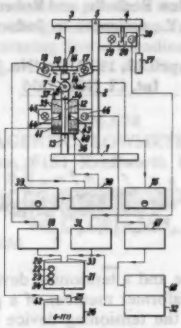
Filed Dec. 16, 1970, Ser. No. 98,819

Claims priority, application Switzerland, Dec. 17, 1969, 18703/69

Int. Cl. G01n *3/32*

U.S. Cl. 73—99 **6 Claims**

A torsional oscillation device for testing plastics material having a first clamp for holding one end of a plastics test specimen and a second clamp for the opposite end of the specimen. The second clamp is rigidly connected to an oscillator unit suspended from means for applying tension to hold the test specimen in tension, whereby the specimen, the oscillator unit and the second clamp form a torsion pendulum. A temperature chamber surrounds the specimen and a device measures the duration of oscillations of the torsional oscillation of the torsion pendulum. The means for applying tension is connected to a converter which converts the longitudinal movements of the tensioner into correspondingly valued elec-



trical signals which render an indication of alterations in length of the test specimen.

3,696,665

CONTACT ANGLE MEASUREMENT OF PLASTIC SURFACES

Wassily Poppe, Lombard, Ill., and Habet M. Khelghatian, Springfield, Pa., assignors to Standard Oil Company, Chicago, Ill.

Filed March 1, 1971, Ser. No. 119,877

Int. Cl. G01b *19/08*

U.S. Cl. 73—104 **14 Claims**

A non-destructive test is provided for determining the ability of a metal coating to adhere to the plastic substrate of a metallized plastic article comprising determining the difference between two separate contact angle values, the first being obtained by measuring the contact angle formed by a drop of liquid resting on a specimen plastic substrate prior to etching said substrate and the second being obtained by measuring the contact angle formed by a drop of liquid resting on an etched plastic substrate. Contact angle values are easily measurable parameters which indicate platability and therefore are valuable in the electroplating of plastics.

3,696,666

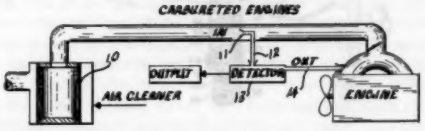
DUST LEAK DETECTOR FOR AIR CLEANER SYSTEMS

Lemoine L. Johnson, and William P. Timmons, both of Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 15, 1969, Ser. No. 870,458

Int. Cl. G01m *15/06*

U.S. Cl. 73—118 **11 Claims**



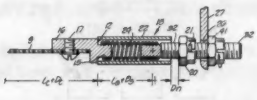
Apparatus and method is disclosed for continuously sampling, at a point downstream of the air cleaner, the normally clean air entering an engine to produce a signal indicating the cleanliness of the total air stream entering the engine. A sample of the air is continuously circulated through a small detector filter and the resistance of the filter to air flow is continuously monitored. In case of dust leakage, the resistance of the detector filter increases very rapidly because of increased dust loading, giving an immediate indication of the abnormal condition.

3,696,667

TENSIONING DEVICE FOR POSITION MEASURING TRANSFORMER

Vincent F. Foster, New Rochelle, and Robert A. Schreitz, Hartsdale, both of N.Y., assignors to Inductosyn Corporation, New York, N.Y.

Filed April 22, 1970, Ser. No. 30,838
Int. Cl. G01l 5/06
U.S. Cl. 73—143 8 Claims



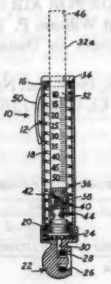
Tensioning device and a tensioning device in combination with an elastic transformer member of a position measuring transformer where the tensioning device stores a record of desired length and renders an indication of when the elastic member is at that desired length. The elastic member is typically a tape scale of steel which insulatingly supports a planar transformer winding. To permit accurate transformer operation, the elastic member, and therefore the supported winding, is at a desired length, such as a calibrated length, which is established by tensioning both the elastic member and the tensioning device until the tensioning device indicates that the desired length has been reached. The tensioning device includes elastic means, such as a spring, which substantially exhibits a predetermined force when constrained to a predetermined length. The tensioning device also includes calibrated means, such as a calibrating nut on a threaded shaft attached to the spring with the spring and shaft extending through a sleeve, for indicating when the elastic means is constrained substantially to the predetermined length as measured between a reference position and a calibration position.

3,696,668

COMBINED AIR PRESSURE AND THREAD DEPTH GAUGE FOR PNEUMATIC TIRES

John L. Patrick, 5825 Rogue Valley Highway, Central Point, Oreg.

Filed July 6, 1971, Ser. No. 159,951
Int. Cl. B60c 23/02
U.S. Cl. 73—146.8 5 Claims



The conventional pneumatic pressure gauge and the conventional tire depth gauge are combined into a single implement, the single indicator slide being

a. adapted to be pulled out manually and then thrust inward to a point determined by the depth of tread by engagement with the tire;

b. adapted to be thrust outward by pneumatic pressure when applied to a tire valve and afterward returned manually to normal position within the implement body; and

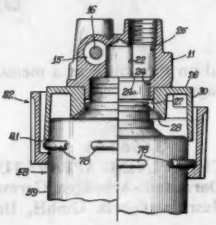
c. graduated in terms of pneumatic pressure on one face and in terms of tread depth on the opposite face.

3,696,669

TEST PLUG FOR FILTER ASSEMBLY

Robert J. Brejcha, Westchester, and William H. Corbett, Lincolnshire, both of Ill., assignors to Everpure, Inc., Oak Brook, Ill.

Filed March 18, 1971, Ser. No. 125,756
Int. Cl. G01m 19/00
U.S. Cl. 73—168 8 Claims



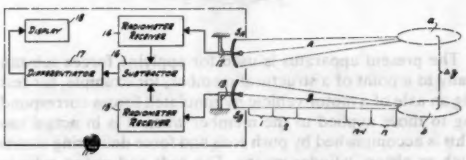
A fluid pressure line test plug for use in connection with a filter assembly mounting head which is fixedly mounted in a fluid line and wherein the head has inlet and outlet ports the test plug being formed with fluid passage means permitting direct communication between the inlet and outlet ports of the head member disposed in the fluid pressure line.

3,696,670

METHOD AND SYSTEM FOR DETECTING CLEAR AIR TURBULENCE

Ronald T. H. Collis, Menlo Park, Calif., assignor to Stanford Research Institute

Filed July 9, 1970, Ser. No. 53,613
Int. Cl. G01w 1/08
U.S. Cl. 73—170 R 12 Claims



A method and system is disclosed which utilizes the radiation emitted by regions of clear air turbulence to remotely detect such regions. An airborne radiometer receives a plurality of signals from ahead of an aircraft at a plurality of angles with respect to the aircraft's path. These signals are compared to form a gradient signal. The rate of change of the gradient signal is monitored to give an indication of clear air turbulence.

3,696,671

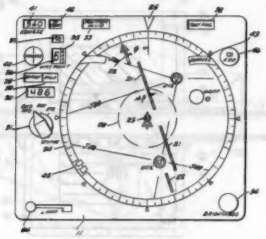
AIRCRAFT HORIZONTAL SITUATION NAVIGATION DISPLAY SYSTEM

Charles J. Steigleder, Encino; Linual D. Smithey, Pacific Palisdaes, and Lloyd E. Lydon, Northridge, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 18, 1970, Ser. No. 73,399
Int. Cl. G01c 21/00
U.S. Cl. 73—178 R 15 Claims

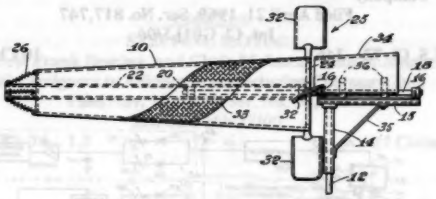
A display system is disclosed for a navigation director system in which a portion of an azimuth stabilized navigation chart is displayed optically with the aircraft position on the chart at the center of the display, and a selected radial course for VOR airway navigation is displayed optically as a course bearing indicator (CBI) in the form of an arrow that points to

a course bearing on an azimuth stabilized compass ring. The center of the arrow is replaced by a lateral deviation bar (LDB) that is displaced from the CBI in proportion to the angular deviation of aircraft position from the selected course. For area navigation between selected way points on the chart,



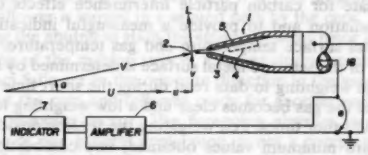
the CBI is positioned to indicate the course bearing of a computed great circle route and the LDB is displaced in proportion to the cross-track distance off course. For conventional VOR navigation, the chart display may be independently turned off.

3,696,672
WIND SOCK
John Lindsay, 16 Harbor Street, Manchester, Mass.
Filed Sept. 15, 1970, Ser. No. 72,409
Int. Cl. G01w *1/02*
U.S. Cl. 73—189 **14 Claims**



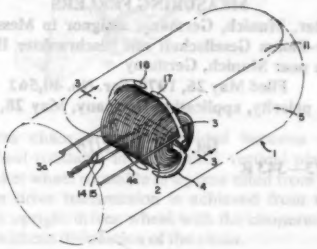
An instrument for determining the direction and speed of the wind commonly referred to as a "wind sock" which is mounted to rotate through a horizontal plane to indicate the wind direction and is characterized by having provision for also rotating on its own axis to indicate the force or speed of the wind. The wind sock can also be mounted to pivot in a vertical plane in response to the force of the wind.

3,696,673
METHOD AND MEANS OF MEASURING VELOCITY FLUCTUATIONS IN UNSTEADY FLOW
Herbert S. Ribner, Willowdale, Ontario, and Thomas E. Siddon, Don Mills, Ontario, both of Canada, assignors to The Governors of the University of Toronto
Filed April 1, 1968, Ser. No. 717,846
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B **12 Claims**



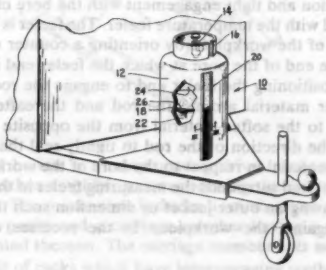
A gauge for measuring flow unsteadiness comprising a lift-sensor element having a lift-sensing surface to be presented to flow velocity disturbances perpendicular to a main stream flow to develop a time varying lift force with corresponding displacement responsive to time variations of the velocity disturbances, and means to translate the displacement variations into an alternating current to operate an indicator, and the method of measuring flow unsteadiness utilizing the principle of lift-sensing to detect flow velocity disturbances.

3,696,674
ELECTROMAGENTIC FLOWMETER APPARATUS
Merrill P. Spencer, 5151 Kenilworth Place, N.E., Seattle, Wash.
Filed June 19, 1968, Ser. No. 738,306
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 EM **19 Claims**



Electromagnetic flowmeters wherein voltages induced in a conductive fluid flowing through magnetic fields having boundaries defined by magnetic cores impress voltages on the cores which are in turn coupled to output circuitry by electrodes connected to the cores.

3,696,675
METHOD AND MEANS FOR DETERMINING LIQUID LEVEL IN A CONTAINER
A. Scott Gilmour, Williamsville, N.Y., assignor to Technomedic Corporation, Buffalo, N.Y.
Filed Sept. 20, 1971, Ser. No. 181,977
Int. Cl. G01f *23/22*
U.S. Cl. 73—295 **12 Claims**



Apparatus and a method for externally determining the level of a mass of flowable material such as liquid or granular material contained in a closed or sealed container includes an elongated strip of material coated or imbedded with cholesteric liquid crystals which vary chromatically with variations in temperature. The elongated strip is applied to the outer surface of the wall of the container in heat conducting relationship thereto and extends along the height of the container. The container is exposed to a temperature change either natural, such as that which occurs at sunset and sunrise, artificially induced, such as dousing with water at a temperature different from the ambient temperature of the container or by energiz-

ing a heater element at the wall of the container adjacent the elongated strip. Because of the difference in the rate of heat conduction of the void volume and the filled space of the container, the container wall experiences a temperature gradient which is most pronounced at the interface of the contents. The temperature of the container wall changes abruptly at the surface of the contents. This change in temperature is readily discernible visually because of the abrupt change in color of the elongated strip at the material interface thus permitting an observer to readily detect the level of the contents in the container.

3,696,676

METHOD AND ARRANGEMENT FOR INSTALLING MEASURING FEELERS

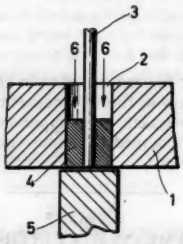
Karl Butter, Munich, Germany, assignor to Messerschmidtt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrum near Munich, Germany

Filed May 26, 1970, Ser. No. 40,562

Claims priority, application Germany, May 28, 1969, P 19 27 147.7

Int. Cl. G01k *1/16*

U.S. Cl. 73—343 R **9 Claims**



A measuring feeler is incorporated in a bore of a workpiece by surrounding it with a filling material which is softer than that of the feeler and the workpiece and by applying a compressive pressure to the softer material to cause its plastic deformation and tight engagement with the bore of the workpiece and with the temperature feeler. The feeler is installed in the bore of the workpiece by orienting a counter member or rod at the end of the bore at which the feeler end is to be exposed, positioning the feeler end to engage the rod, applying the softer material around the rod and thereafter applying pressure to the softer material from the opposite end of the bore in the direction of the rod to tightly seal the feeler and the soft material in respect to the bore of the workpiece. The softer material surrounds the measuring feeler in the form of a sleeve having an outer jacket or dimension such that it bears tightly against the workpiece in the recesses or grooves thereof.

3,696,677

FLOW-LINE THERMOMETER

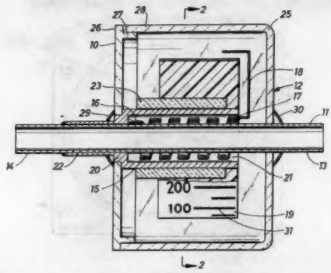
Robert T. Luedeman, Metuchen, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Feb. 3, 1971, Ser. No. 112,363

Int. Cl. G01k *13/02, 5/62*

U.S. Cl. 73—343 R **5 Claims**

This invention relates to a temperature measuring device for fluid streams. In the embodiment disclosed, a helical bimetallic element is wound along a tubular member. One end of the bimetal is attached to the tube and the other end is coupled to a pointer which rotates about a scale mounted on the



tubular member to indicate the temperature of the fluid inside the tube.

3,696,678

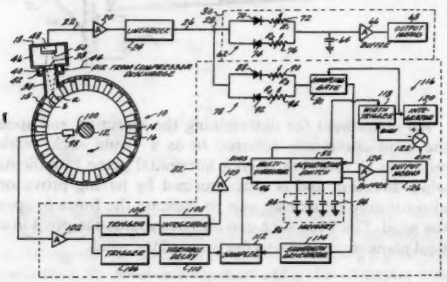
WEIGHTED OPTICAL TEMPERATURE MEASUREMENT OF ROTATING TURBOMACHINERY

Paul W. Mossey, Cincinnati, Ohio, assignor to General Electric Company

Filed April 21, 1969, Ser. No. 817,747

Int. Cl. G01j *5/06*

U.S. Cl. 73—346 **10 Claims**

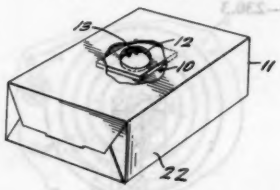


An optical pyrometry system for measuring temperature in hydrocarbon fueled gas turbine engines is disclosed wherein means are provided for weighting the instantaneous output of an infrared sensing device. Because of the random occurrence of interposition of carbon particles between the sensing device and a selected metal surface, the weighting means are able to compensate for carbon particle interference effects on infrared radiation and to provide a meaningful indication of both metal surface temperature and gas temperature. Temperature of the selected metal surface is determined by applying a high weighting to data read during the short time intervals when the gas becomes clear and a low weighting to data read at all other times, i.e., weighting the sensing device output toward minimum values obtained; and combustion gas temperature is determined by weighting the sensing device output toward peak values obtained, when represent primarily radiation emission from carbon particles.

3,696,679
THAW SENSOR

Victor S. Peterson, 2701 Lynn Drive, Sandusky, Ohio, and Arthur J. Gnecco, 91 Edison Drive, Milan, Ohio

Filed Dec. 30, 1970, Ser. No. 102,751
Int. Cl. G01k 11/06
U.S. Cl. 73—358 10 Claims

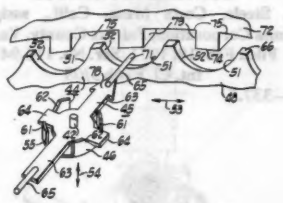


An improved method and device for determining if a frozen article has been thawed or has exceeded a predetermined temperature during storage or transit. A resilient electrical conductor shaped in the general form of a loop is frozen in a mass of material such that the loop is stressed. The frozen mass and conductor are stored with the frozen article. When the mass of material is thawed, the stressed loop relaxes to change electrical states either from an open circuit to a shorted circuit or from a shorted circuit to an open circuit. The changed state is maintained, even though the article may be refrozen. A shorted turn tester is used to determine the electrical state of the loop, thereby indicating if the frozen article has been thawed.

3,696,680
STEPPING MOTOR

Andrew Frank Deming, and Clyde M. Lucas, both of Alliance, Ohio, assignors to Alliance Manufacturing Company, Inc.

Filed Nov. 18, 1970, Ser. No. 90,704
Int. Cl. F16h 27/00
U.S. Cl. 74—1.5 27 Claims

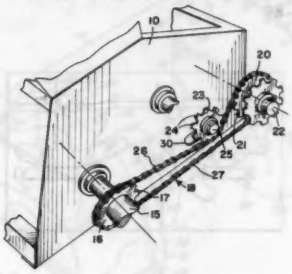


A stepping motor is disclosed which has a ratchet movement in a series of steps in a first path, which in the preferred embodiment is a circular path. The stepping motor is usable in a follow-up motor control system such as an antenna rotator with the rotator bi-directionally controlled in rotation and intermittently closing a pulsing switch. The stepping motor is usable as an indicator motor with this motor intermittently energized in accordance with energization of the rotator motor and closure of the pulsing switch. This supplies a torque to move a cam in a first path until it strikes an abutment. A cam follower is moved in a second path by the cam. The cam striking the abutment stalls the stepping motor rotor and upon opening of the pulsing switch, a spring urging means moves the cam follower in the opposite direction in the second path to reset the cam and follower ready for another energization of the stepping motor. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,696,681
TILT WHEEL CHAIN DRIVE

John T. Fetter, Carlisle, Ontario, and Nils O. Olsson, Ancaster, Ontario, both of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 25, 1970, Ser. No. 92,628
Int. Cl. F16h 7/12; B60k 17/28
U.S. Cl. 74—13 7 Claims

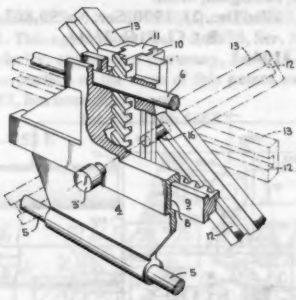


An endless chain drive is provided between a driven sprocket wheel rotatable in a generally vertical plane and a driver sprocket wheel rotatable in a plane tilted from the vertical, wherein drive transmission is achieved from the tilted driver to the upright driven wheel with the cooperation of an idler wheel without dislocation of the chain.

3,696,682
RECIPROCAL DRIVE MECHANISM

Carlos Matas, Valence, France, assignor to Etablissements Pain-Bourgeas, Valence, France

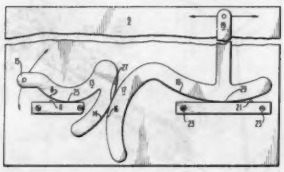
Filed Dec. 18, 1969, Ser. No. 886,214
Int. Cl. F16h 25/12
U.S. Cl. 74—57 9 Claims



Disclosed herein is a reciprocating drive mechanism and means for either amplifying or suppressing the output of the mechanism. The mechanism includes a rotating cam adjacent to which is positioned a carriage member having a cam follower mounted thereon. The carriage member acts as a housing for a pair of racks which have interengaging teeth and are preferably mounted perpendicular to each other. The carriage is mounted for translatory movement in response to the action of the cam and cam follower and the racks are forced into relative movement with respect to the carriage by a stationary elongated member. The elongated member has a track on one face thereof, in which is engaged a roller, the roller being mounted on the surface opposite the teeth of one of the racks. When the carriage moves, the follower within the elongated member will force its associated rack to move within the carriage, which movement of the associated rack will cause the other rack to have corresponding movement. The angular orientation of the elongated member controls the amount of movement of the other rack and can be adjusted to cause the

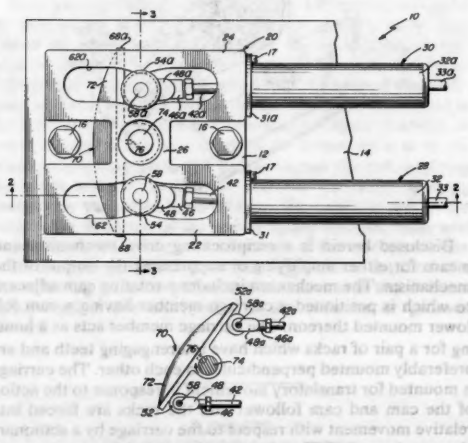
effective movement of the other rack to be amplified or suppressed.

3,696,683
ROLLING JOINT MECHANISMS
Preben W. Jensen, 21 Southside Avenue, Somerville, N.J.
Filed May 15, 1970, Ser. No. 37,620
Int. Cl. F16h 27/02, 29/02, 29/20
U.S. Cl. 74—89 12 Claims



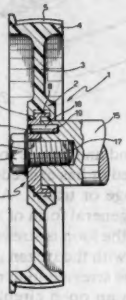
A rolling joint mechanism consisting of three parts which translates an angular input motion into an output motion of a different form. The parts, comprised of an input member, an output member and a frame, engage each other at specific points along contact surfaces and the points of contact of the three parts are all in a straight line. In addition, substantially pure rolling motion takes place at the engaging surfaces so that the mechanism is substantially free of sliding friction. Finally, the mechanism has the feature that the rolling surfaces may be reshaped so as to allow the mechanism to produce a variety of output motions for a given input motion.

3,696,684
MOTION CONVERTER ASSEMBLY
Raymond J. Estlick, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Dec. 21, 1970, Ser. No. 99,862
Int. Cl. F16h 21/44
U.S. Cl. 74—104 19 Claims



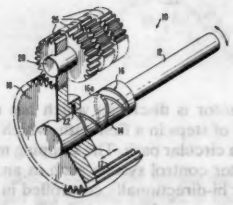
A mechanism for converting the motion of a reciprocally movable member into a variable torque which produces limited angular motion of a rotatable member, said mechanism comprising a reciprocally movable rod carrying a radially extending pin which projects slidingly through a cam-shaped slot in a rigid support member and slidingly engages a moment arm having a portion thereof fixedly attached to a rotatable shaft.

3,696,685
TOOTHED PULLEYS
Aurelio Lampredi, Turin, Italy, assignor to Fiat Societa per Azioni and Cigala & Bertinetti S.a.s., both of Turin, Italy
Filed April 16, 1971, Ser. No. 134,778
Claims priority, application Italy, April 21, 1970, 68350 A/70
Int. Cl. F16h 55/36
U.S. Cl. 74—230.3 5 Claims



A toothed pulley of the kind which meshes with a toothed belt in a cam-shaft drive for an internal combustion engine has a body, including a hub, moulded in plastics, with a cup-shaped metal hub reinforcement which is incorporated in the plastics material of the hub. A cavity is formed in the hub to receive a cylindrical end of a shaft to which the pulley is to be secured, the cylindrical surface of the cavity being formed by the plastics material of the hub and not by the metal hub reinforcement.

3,696,686
CONTROL APPARATUS
Michael F. Steele, Costa Mesa, Calif., assignor to The Susquehanna Corporation, Fairfax County, Va.
Filed Feb. 19, 1971, Ser. No. 116,947
Int. Cl. F16h 5/08
U.S. Cl. 74—337.5 16 Claims



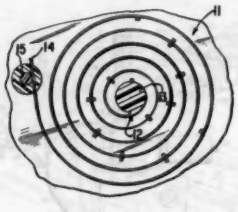
Control apparatus for effecting a plurality of output functions, comprising a drive member that is movable into driving engagement with each of a plurality of driven output members, a movable input member having a cam groove disposed on the outer surface thereof, and a pin mounted on the drive member and slidably engaged in the cam groove. Depending on the configuration of the cam groove, the movement of the input member may cause the pin to move along the cam groove and to effect movement of the drive member into driving engagement with one of the output members, or may cause the pin to move with the input member to thus effect movement of the drive member with the input member.

3,696,687

PLASTIC HAIRSPRING

Philip W. Harland, Perkasie, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed March 25, 1971, Ser. No. 127,974
Int. Cl. F16b 55/00; G04b 17/06
U.S. Cl. 74—431 8 Claims



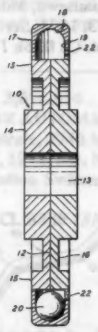
A spiral hairspring is molded from a resilient plastic material so that the several turns thereof are interconnected by a plurality of bridges to facilitate flowing the plastic material throughout the narrow confines of the mold passages. The interconnecting bridges are then cut from between the several turns to form the hairspring. Also, the hairspring may be molded integral with a shaft having a pinion gear thereon.

3,696,688

AUTOMATIC BALANCER FOR ROTATING MASSES

Eugene A. Goodrich, 4101 Wedgworth Road South, and Robert H. Johnson, 6601 South Hulen Street, both of Fort Worth, Tex.

Filed May 3, 1971, Ser. No. 139,758
Int. Cl. F16f 15/32
U.S. Cl. 74—573 3 Claims



An automatic balancer for rotating masses comprised of a race having a semicircular periphery and parallel inner walls, a hub snugly received in the race and of a width to engage the walls' inner circumferences and steel balls in the race, the balls having radii slightly less that the radius of the semicircular portion of the race periphery.

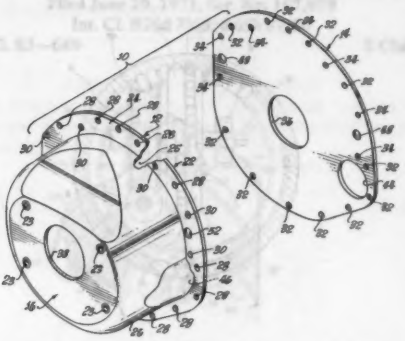
3,696,689

SAFETY HOUSING

Louis Senter, and Robert E. Johnson, both of Los Angeles, Calif., assignors to Whittaker Corporation

Filed Feb. 12, 1971, Ser. No. 114,826
Int. Cl. F16p 1/02
U.S. Cl. 74—609 10 Claims

This invention includes a bell housing and a deflector plate which is connected to and which covers the open end of the bell housing to form, in combination, a safety housing for containing, inter alia, flywheel fragments. The safety housing substantially encloses both a clutch assembly and a flywheel which is carried on a crankshaft extending through the deflector plate and is connected at its forward end to an engine block and at its rearward end to a transmission housing. The bell housing is formed from a high ductile metal and the



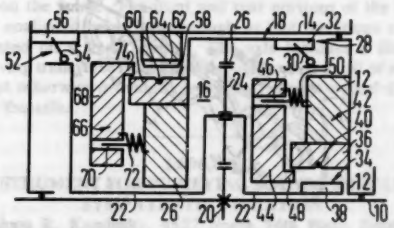
deflector plate is formed from a metal of medium ductility. The bolts used to interconnect them are formed from a high tensile and, preferably, low ductile metal so that deformation of the bell housing causes similar deformation of the deflector plate. Attachment of the safety housing to the engine block is preferably by soft metal bolts.

3,696,690

AUTOMATICALLY SHIFTING MULTIPLE SPEED HUB

Hans Joachim Schwerdhofer, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Continuation of Ser. No. 830,779, June 5, 1969, Pat. No. 3,546,971. This application Dec. 14, 1970, Ser. No. 97,519
Claims priority, application Germany, June 15, 1968, P 17 50 897.3. The portion of the term of this patent subsequent to Dec. 15, 1987, has been disclaimed.
Int. Cl. F16h 5/42
U.S. Cl. 74—752 E 4 Claims



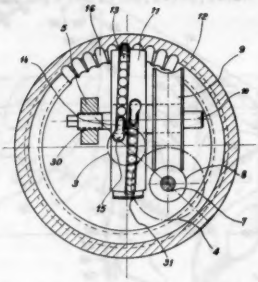
A bicycle hub having built in planetary gears arranged in tandem for providing three or more transmission ratios is equipped with an overrunning pawl-and-ratchet clutch between the driver and the ring gear of the first set of planet gears and with a centrifugal governor, which is connected either with the hub shell or the driver for rotation thereby, and operates a second clutch interposed between the driver and the planet carrier of the first set of planet gears. The arrangement permits a relatively great number of transmission ratios to be achieved with a minimum number of centrifugal governors.

3,696,691

TWO-STAGE WORM GEAR TRANSMISSION

Georg Titt, Obere Vorstadt 9, D-8358 Vilshofen, Germany

Filed Dec. 21, 1970, Ser. No. 100,316
Int. Cl. F16h *1/28, 3/44*
U.S. Cl. 74—797 10 Claims



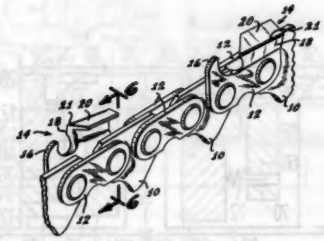
A two-stage worm gear transmission in which a first-stage worm gear drive has a worm wheel operatively connected with a worm of a second-stage worm gear drive to drive the latter worm. The second-stage worm gear drive includes a stationary worm wheel having an inner periphery provided with teeth which mesh with the worm of the second-stage drive. Both the first-stage worm gear drive and the worm of the second-stage worm gear drive are carried by a rotary frame which has an axis coinciding with the axis of the stationary worm wheel.

3,696,692

PROCESS FOR FORMING A SAW CHAIN CUTTER LINK

Karl F. Baranowski, and Alexander Barrio, Jr., both of Milwaukie, Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Filed April 26, 1971, Ser. No. 137,377
Int. Cl. B23d *63/00*
U.S. Cl. 76—112 2 Claims



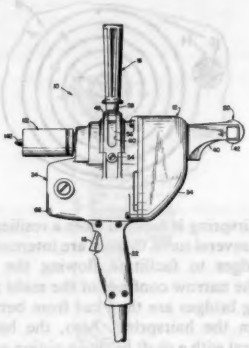
A saw chain comprised of center links interconnected by side links. Certain of the side links having extensions forming cutter portions for cutting trees and the like. Said cutter portion including a side plate and top plate with an intermediate, substantially sharp corner. The thickness at said corner is greater than the thickness of the side plate and top plate. Said thickened corner being formed by first coining a thickened rib-like section into the cutter blank prior to bending the top plate and then forming the top plate by bending in such a manner that the thickened section becomes located at the corner.

3,696,693

IMPACT WRENCH

Donald R. Bosten, and Michael Rusnak, both of Pittsburgh, Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 18, 1969, Ser. No. 877,688
Int. Cl. B25b *17/00, 19/00*
U.S. Cl. 81—52.3 10 Claims



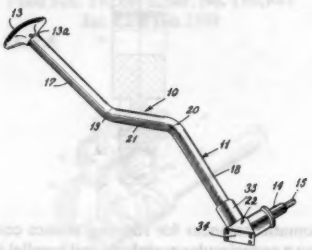
Impact wrenches comprising a casing housing an axially movable, non-rotatable, fastener-engaging component, a retainer engaging component, and a motor for rotating the retainer-engaging component.

3,696,694

HAND TOOL FOR REACHING REMOTE LOCATIONS

William B. Boro, St. Petersburgh, Fla., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Feb. 3, 1971, Ser. No. 112,248
Int. Cl. B25b *17/00*
U.S. Cl. 81—57.27 8 Claims



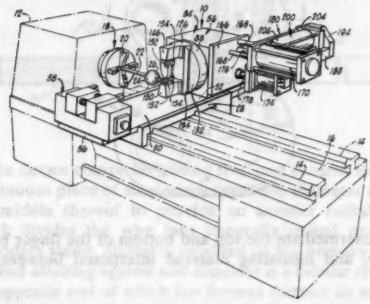
A hand tool for reaching remote locations that includes an elongated hollow tube having two substantially straight end sections whose inner terminal portions are offset from each other and a center section that connects these end sections. A flexible cable is rotatably mounted within the tube and one end of the cable is securely fastened to a handle that projects beyond the one end of the tube. The opposite end of the cable is securely connected to a bevel gear that meshes with another bevel gear which is in turn connected to a chuck that is adapted to hold a tool bit. In one embodiment of the invention, the teeth of the bevel gears are rounded so that the bevel gear that is connected to the chuck can be rotated in order to present the tool bit at various angles with respect to the adjacent end section of the tube.

3,696,695

METHOD AND APPARATUS FOR FINISHING SPHERICAL SURFACES

Ladd M. Adams, Norman, Okla., assignor to Balon Corporation, Oklahoma City, Okla.

Filed Jan. 18, 1971, Ser. No. 107,344
Int. Cl. B23b *3/00, 3/28*
U.S. Cl. 82—1 C 21 Claims



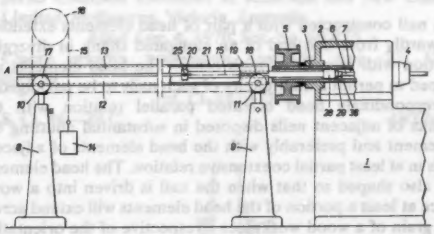
An apparatus which includes a base frame, a workpiece-supporting rotatable chuck mounted on the base frame, a cross-slide movably mounted on the base frame and a rotatable workhead mounted on one end of the cross-slide. One or more pairs of radially opposed cutting tools are adjustably mounted on the workhead, the axis of rotation of the workhead being normal to the axis of rotation of the workpiece-supporting chuck. Facing tools are also mounted on the opposite end of the cross-slide. A control system is provided to automatically and precisely control the operation of the various tools. The radially opposed cutting tools are adapted to be moved radially inward to engage the rotating workpiece and while so engaging the workpiece, are revolved about the axis of rotation of the workhead thus generating a spherical surface on the workpiece.

3,696,696

BAR FEED FOR AUTOMATIC LATHE

Andre Bechler, 4, rue Centrale, 2740 Moutier, Switzerland

Filed Jan. 27, 1971, Ser. No. 110,036
Claims priority, application Switzerland, March 20, 1970, 4262/70
Int. Cl. B23b *13/00*
U.S. Cl. 82—2.5 4 Claims



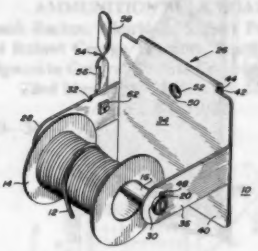
A bar feed for a rotary spindle lathe is provided with an arrangement for positively guiding the rear end of the bar being fed without interfering with its longitudinal motion. The bar feed arrangement includes a pair of V-shaped guide rails defining a guide diameter the same as the bore through the spindle. A feed rod is guided in the channel by a collar at each end, with the rear collar being non-rotatably secured to the feed rod and the front collar being rotatably journaled on the feed rod and also rotatably journaled with respect to the bar stock gripping collet so that it may be selectively rotatable or non-rotatable depending upon whether it is in the guide channel or the lathe spindle.

3,696,697

DISPENSER FOR REEL OF FILAMENT MATERIAL

John T. Hoffman, 1604 East Greenleaf Street, Allentown, Pa.

Filed June 29, 1971, Ser. No. 157,979
Int. Cl. B26d *7/00*; B65h *49/00*
U.S. Cl. 83—649 8 Claims



A dispenser for a reel of filament material, such as solder, includes an axle having a transverse through hole near each end thereof. An integral frame, formed from a sheet of metal, supports the axle. The frame has a first side portion having a threaded hole therewithin and having a filament receiving notch associated therewith, a second side portion, and a main body portion integrally formed with the two side portions. Both side portions are formed at right angles with respect to the main portion so that the axle can be received within holes formed in both side portions. An elongated cutter, having a blade portion and a finger engaging portion, has a bolt receiving hole therethrough. The cutter is pivotally affixed to the first side portion of the frame by suitable means such as a bolt and a lock nut. The bolt passes through the cutter hole and engages with the threaded hole of the side portion of the frame, and with the lock nut, so that the blade portion becomes selectively engageable with the filament receiving notch. The main body portion of the frame includes a front portion which is integrally formed with the side portions, and further includes a rear portion integrally formed with the front portion in an open loop so as to form an inverted J in cross section, thereby enabling the dispenser to be carried at waist level by the loop of the frame engaging with a wearer's belt. Suitable means, insertable within each of the transverse through holes, retain the axle on the frame. The front and rear portions of the frame have coaligned holes therethrough so that the frame can be mounted on a fixed support. The axle includes a filament receiving transverse hole therethrough so that a roll of material, not otherwise provided on a spool, can be wound directly upon the axle.

3,696,698

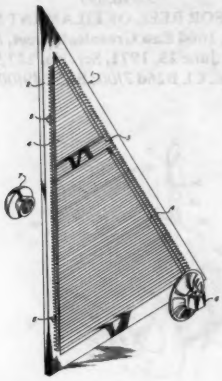
INSTRUMENT FOR PURIFYING SOUNDS THROUGH SYMPATHETIC VIBRATION

Abraham R. Kaminsky, 4527 North 74th Place, Scottsdale, Ariz.

Filed May 12, 1971, Ser. No. 142,678
Int. Cl. G10d *1/00, 3/02*; G10h *3/00*
U.S. Cl. 84—173 1 Claim

A very carefully tuned stringed instrument is provided with a range preferably approximating that of a piano. The strings are disposed in the path of ambient sound waves, such as music, and function to purify or eliminate those components of the sound which are not attuned to one or more of the instrument strings. A microphone may be utilized to pick up the purified sound and, in one embodiment, a portion of the apparatus constituting the purifier is disposed on one side of a soundproof wall such that the microphones which pick up the

purified sound are not subjected to the sound source. In a variant embodiment, a chromatic set of tuning forks may be utilized in conjunction with the strings to assist both in tuning the instrument and in carrying out the purification process. An instrument in which a complete set of tuning forks or other tuned elements are used in place of or in combination with strings is also contemplated, the inventive concept being the purifying nature of the closely tuned vibratory elements responding sympathetically to the ambient sound.

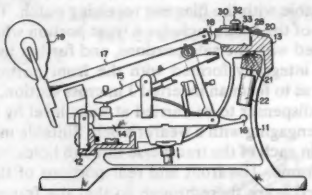


3,696,699

HAMMER FLANGE MOUNTING STRUCTURE FOR USE IN PIANO

Hiroki Tachida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed May 3, 1971, Ser. No. 139,676
Claims priority, application Japan, May 8, 1970, 45/44606
Int. Cl. G10c *3/18*
U.S. Cl. 84—251 **6 Claims**



A hammer flange having a hammer shank rotatably attached to one end thereof is mounted on the cut-out portion of a flange rail. A plate spring fixed to the flange rail is extended over the hammer flange and is biased toward the hammer flange, the plate spring having a threaded hole at that part thereof facing the hammer flange. A screw means is screwed into the hole, exerting a pressure on the hammer flange under the biasing force of the spring, so that the hammer flange is securedly mounted on the flange rail.

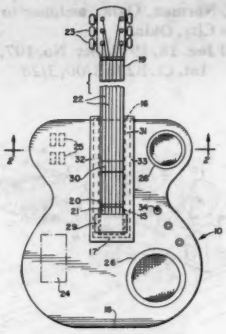
3,696,700

ELECTRICAL MUSICAL STRINGED INSTRUMENTS

Michael P. Berardi, P.O. Box 852 Buena Vista Station, Miami, Fla.

Continuation-in-part of Ser. No. 63,849, Aug. 14, 1970, abandoned. This application Aug. 3, 1971, Ser. No. 168,545
Int. Cl. G10d *3/00*
U.S. Cl. 84—291 **4 Claims**

A stringed musical instrument having a hollow body and a solid finger board, the body having a channel with which the finger board cooperates and fills the channel, the spacing of the sides of the finger board and that of the body being reduced intermediate the top and bottom of the finger board and body, and insulating material interposed between the sides.

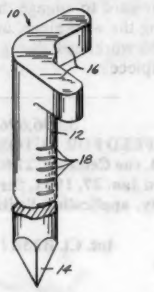


3,696,701

NAIL HAVING A PAIR OF OUTWARDLY DIVERGING HEAD ELEMENTS SHAPED TO PROVIDE PACKAGING, DRIVING AND FASTENING EFFECTIVENESS AND PACKAGE THEREOF

Peter A. Readyhough, Barrington, R.I., assignor to Textron Inc., Providence, R.I.

Filed Dec. 29, 1969, Ser. No. 888,383
Int. Cl. F16b *15/02*
U.S. Cl. 85—28 **4 Claims**



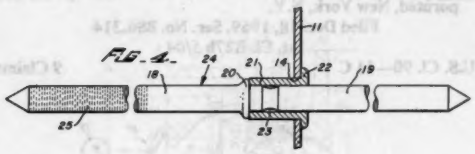
A nail constructed with a pair of head elements extending outwardly from one end of an elongated shank in diverging relation with respect to each other. The head elements are shaped to permit a multiplicity of such nails to be packaged in correspondingly head oriented parallel relation with the shanks of adjacent nails disposed in substantial abutting engagement and preferably with the head elements of adjacent nails in at least partial coextensive relation. The head elements are also shaped so that when the nail is driven into a workpiece at least a portion of the head elements will extend across the grain of a wood workpiece irrespective of the orientation of the head elements with respect to the workpiece. The head elements are also shaped so that the nail can be driven from a package of such nails within a fastener driving tool in such a way that guiding contact with the shank can be maintained at three annularly spaced locations thereabout so that movement in all four transverse component directions can be controlled substantially throughout the longitudinal driving movement of the nail and the driving movement can be accomplished by a fastener driving element having a size and shape at least equal to the shank and disposed in alignment therewith without head interference from the next adjacent nail of the package.

3,696,702

BLIND RIVET FOR TIEING HEAT INSULATION LINER IN AIR CONDUIT

John L. Krause, 15831 La Vida Drive, Palm Springs, Calif.

Filed Sept. 19, 1969, Ser. No. 859,271
Int. Cl. F16b *19/10*
U.S. Cl. 85—77 4 Claims



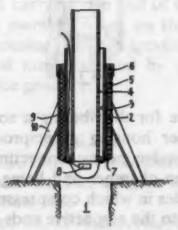
The device comprises a blind rivet and consists in a straight continuous piece of steel wire of uniform diameter upset near the middle thereof to provide an annular radial shoulder which divides the wire into integrally united primary and secondary stems. Slideably received on the primary stem with one end abutting against said shoulder is a tubular rivet sleeve, the opposite end of which has formed thereon an annular external flange. The invention is provided for tieing a relatively thick heat insulation liner against the inner face of the wall of an air conduit which is provided with holes at suitable intervals of a proper diameter to slideably receive said rivet sleeve. The preferred method of employing the invention is to apply a coat of cement to the inner face of said wall and then roll said liner against the tacky inner surface of said wall to line said conduit therewith. The primary stem is then inserted in a blind rivet setting tool and the secondary stem is inserted through one of the holes in said conduit wall and stabbed through the layer of insulation adhering thereto, after which the tool is operated to set said blind rivet in said hole and unite the same with said conduit wall, with said secondary stem protruding inwardly from the inner surface of say layer of insulation. A pinch washer is now pressed onto the protruding inner end of the secondary stem to confine the insulation liner and keep it from falling away from said wall. The unused portion of the primary stem outside the conduit may be removed by wire cutters or this stem may be weakened at a point near said sleeve so that the normal force applied in setting the rivet fractures the primary stem at this point of weakness leaving the rivet permanently united with the conduit wall.

3,696,703

BLASTING AGENT PACKAGE

Richard Fox, Hawthorn, Victoria, Australia, assignor to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

Filed Aug. 4, 1970, Ser. No. 60,873
Claims priority, application Australia, Aug. 22, 1969, 59869/69
Int. Cl. F42d *1/00*
U.S. Cl. 86—20 C 18 Claims



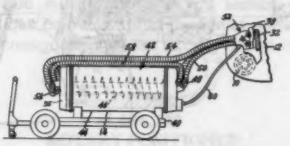
A water-proof package for water-sensitive bulk-loaded blasting agents such as ammonium nitrate slurries and ammonium nitrate fuel oil mixtures comprising an inner and outer plastic tube and mounted between them a liner folded up onto the inner tube in concertina fashion, said tubes optionally being fitted with a constriction to retain the liner within the tubes and with a cap to protect the bottom end of the assembly; the package is attachable to a loading hose for blasting agent and the liner is pushed out through the bottom end of the outer tube by the loading hose or the blasting agent, when charging commences.

3,696,704

AMMUNITION BULK LOADER

Lester Frank Backus, Charlotte; Robert Parker Laurent, Essex, and Robert George Titemore, South Burlington, all of Vt., assignors to General Electric Company

Filed May 13, 1971, Ser. No. 142,882
Int. Cl. F41f *9/02*
U.S. Cl. 89—34 6 Claims



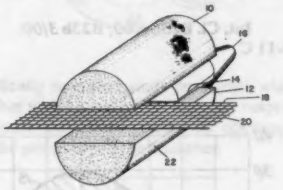
An ammunition handling system is disclosed including a double-ended serial storage device with a controlled conveyor adapted to rapidly transfer ammunition into a gun and storage system in an aircraft and to remove and store unfired rounds and fired cases in a radiation free environment.

3,696,705

COMBUSTIBLE STRIP AMMUNITION BELT

Joseph V. Hrabovsky, 154 Calvo Drive, Salt Lake City, Utah

Filed Aug. 23, 1968, Ser. No. 786,513
Int. Cl. F42b *39/08*
U.S. Cl. 89—35 A 10 Claims



A combustible ammunition belt for caseless ammunition is provided. The belt is fed into the chamber of a firearm with the caseless ammunition and is consumed. The belt is made from a strip of combustible fabric. Caseless rounds are secured to the strip belt. The belt passes through the longitudinal axis of each caseless round.

3,696,706

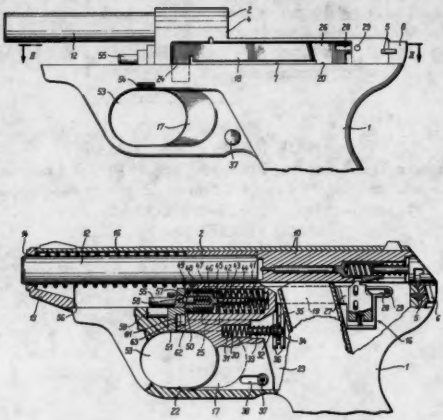
SELF-LOADING PISTOL HAVING FORWARDLY EXTENDING BREECH SLIDE

Alex Seidel; Tilo Moller, both of Oberndorf Neckar, and Helmut Weldle, Beffendorf, all of Germany, assignors to Firma Heckler & Koch GmbH, Oberndorf, Germany

Filed Sept. 17, 1969, Ser. No. 858,644
Claims priority, application Germany, Sept. 18, 1968, P 17 28 251.8
Int. Cl. F41c *23/00*; F41d *11/12*
U.S. Cl. 89—196 14 Claims

A self-loading pistol has a hand grip member which consists entirely of a synthetic resin material into which are embedded

metal parts for supporting the breech member and for guiding it during its recoil movement, a trigger assembly, and means for locking a magazine, the trigger assembly being located in a



trigger casing formed partly by some of the metal parts. Means are provided which permit easy removal and replacement of the breech member and the barrel, and a buffer device may be provided for lessening the recoil shock of the breech member.

3,696,707

CUTTING OF DEPOSIT FORMING STEEL AND CUTTING TOOLS FOR SUCH STEELS

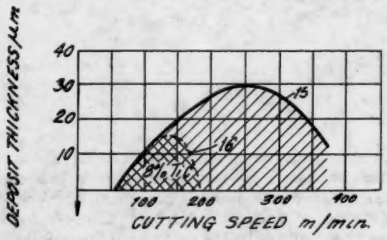
Wolfgang Schedler, and Johann Bodem, both of Reutte, Austria, assignors to Metallwerk Plansee, Reutte, Tirol, Austria

Continuation-in-part of Ser. No. 748,890, June 13, 1968, Pat. No. 3,564,683. This application Jan. 20, 1971, Ser. No. 108,007

Claims priority, application Austria, Sept. 9, 1970, A 8184/70

Int. Cl. B23c *1/00*; B23b *3/00*

U.S. Cl. 90—11 C **3 Claims**



Efficient cutting of deposit forming steels, such as described in French Pat. No. 1,387,441, with tungsten carbide cutting insert having a high tungsten carbide content over an extended period of time is difficult. Efficient cutting of such deposit forming steels over a wide speed range from about 50 to about 350 m/min is made possible by embodying in the cutting edge surface stratum of the cutting tool at least 15 percent of one or more of the carbides or borides of Ti, Ta, Zr, Nb and V, or at least 50 percent aluminumoxide in the tool surface stratum may be embodied either by diffusion, or by affixing such surface layer to a known tungsten carbide insert, or by sintering stratified compacts of powder particle mixtures cohering a thick powder mixture layer containing a large proportion of tungsten carbide is covered along one or on its opposite layer surfaces with a thin powder mixture strata, each of which contains at least 15 percent of one or more of the carbides or borides of Ti, Ta, Zr, Nb and V.

3,696,708

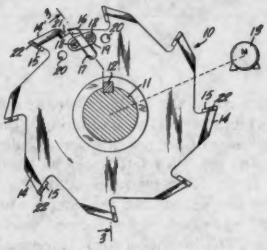
METHOD AND APPARATUS FOR CUTTING THERMOPLASTIC COATED MEMBERS

Kasimir Lopas, Stamford, Conn., assignor to Time, Incorporated, New York, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,314

Int. Cl. B27b *5/04*

U.S. Cl. 90—11 C **9 Claims**



Burr-free fast cutting or machining of workpieces with thermoplastic layers bonded to harder backing members. Both the thermoplastic and its backing member are contacted by a high speed tool, and the thermoplastic layer is trimmed before the produced heat softens or melts the thermoplastic at the trim location. A high speed tool is used which is capable of operating upon the harder member. Offset from the workpiece contacting portion of the high speed tool, one or more trimming teeth trim the thermoplastic layer at intervals inwardly of the machined workpiece area where the thermoplastic is yet to be heated significantly and softened. The high speed tool may be a multitooth rotary cutter blade supporting a single offset tooth.

3,696,709

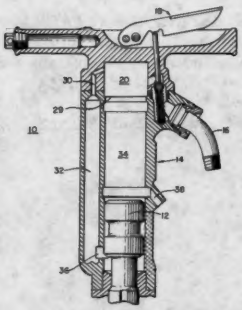
CONTROL DEVICE FOR A RECIPROCATING MACHINE

Albertus E. Schmidlin, Caldwell, N.J., assignor to TPI & Company, Montclair, N.J.

Filed Dec. 4, 1969, Ser. No. 881,994

Int. Cl. F01l *25/06*

U.S. Cl. 91—3 **13 Claims**



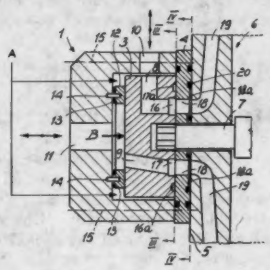
A control device for distributing a source of compressed fluid to a chamber housing a reciprocating member, the device including a valve means connecting the source of compressed fluid to the chamber and being switchable between two operating modes in which compressed fluid is introduced into said chamber to the respective ends of said reciprocating member to cause the latter to reciprocate in said chamber. The valve is normally in one of the modes and is switchable to, and maintained in, the other mode in response to a predetermined pressure existing in the chamber.

3,696,710

DISTRIBUTOR FOR HYDRAULIC MOTORS

Aurelio Ortelli, Bologna, Italy, assignor to Riva Calzoni S.p.A., Bologna, Italy

Filed Oct. 26, 1970, Ser. No. 90,219
Claims priority, application Italy, Nov. 7, 1969, 24092 A/69
Int. Cl. F16k *11/06*
U.S. Cl. 91—487 3 Claims



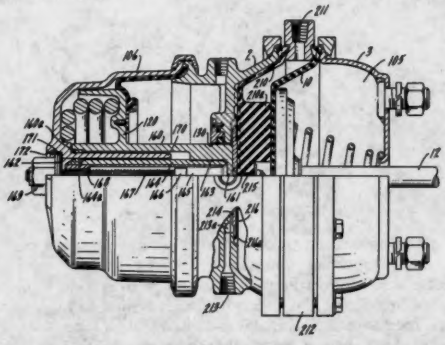
A distributor for hydraulic motors with radially arranged pistons including a rotary member located in a housing in communication with fluid inlet and outlet conduits and having inner passages and sealing means for the fluid.

3,696,711

ROLL DIAPHRAGM BRAKE

Arthur A. Berg, Lincolnwood, and Boleslaw Klimek, Des Plaines, both of Ill., assignors to The Berg Manufacturing Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 26,001, April 6, 1970, abandoned. This application Dec. 28, 1970, Ser. No. 101,914
Int. Cl. F01b *19/00*
U.S. Cl. 92—48 3 Claims



A light weight, compact service and emergency brake assembly employing a roll diaphragm in the emergency chamber, a rearwardly extending mechanical release, a cup-shaped movable wall carrying one end of the roll diaphragm and having an axial member riding on the inner and outer sides of an integral housing sleeve. A service chamber has two diaphragms with seal means carried by one diaphragm to preclude loss of service pressure.

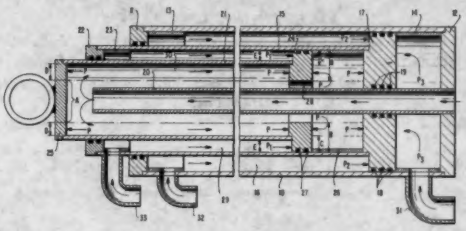
3,696,712

MULTI-SECTION HYDRAULIC RAM

Fu-Tien Sung, Waynesboro, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Sept. 28, 1970, Ser. No. 76,373
Int. Cl. F01b *7/20*
U.S. Cl. 92—52 9 Claims

A three section telescopic hydraulic ram features the ability to have its mid-section and interior or rod section independently actuated. Thus, the mid-section and rod section of the ram may be extended or retracted as a unit relative to the exterior base section, or the mid-section and rod section may move relative to each other in either direction while moving



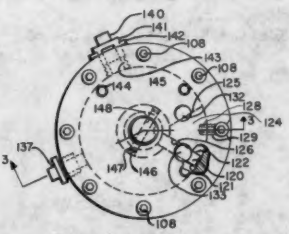
relative to the base section. This capability for individual control of the ram mid-section and rod section is achieved through a unique combination of fluid inlet porting and a divided piston construction for the interior or rod section of the ram.

3,696,713

ROTARY POSITIONER

Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,861
Int. Cl. F01c *9/00*
U.S. Cl. 92—121 7 Claims



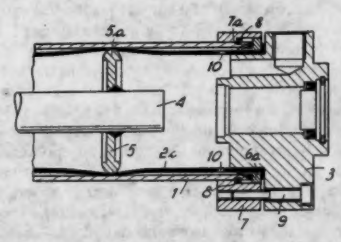
A pneumatically operated shaft positioner which has a C-shaped chamber with a rotary vane member responding to differential pressure conditions caused by opening an exhaust port around the periphery of the chamber.

3,696,714

FLUID-OPERATED CYLINDER

Pier Luigi Panigati, Via Friuli 72, Milan, Italy

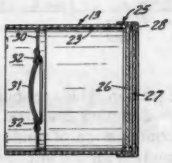
Filed Dec. 29, 1969, Ser. No. 4,181
Claims priority, application Italy, Nov. 11, 1969, 24269 A/69
Int. Cl. F01b *19/04*
U.S. Cl. 92—170 1 Claim



A fluid-operated cylinder in which sealing between the piston and the cylindrical housing is provided by a tubular ele-

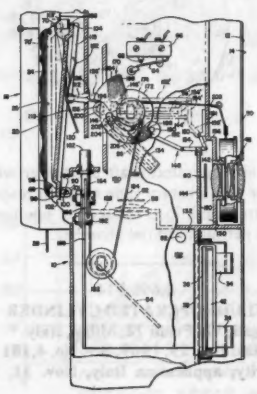
ment of resilient material, such as rubber, plastics material and the like which is placed in said cylindrical housing and extends to a length at least equal to the piston stroke.

3,696,715
BEAM DEFINING APPARATUS
Philip A. Jedlicka, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Dec. 29, 1969, Ser. No. 888,757
Int. Cl. G03
U.S. Cl. 95—1 R 6 Claims



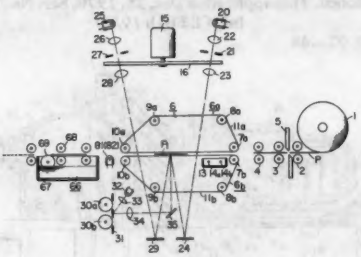
A display device as described in U.S. Pat. No. 3,457,400 is provided with photosensitive means for accurately identifying the outline of the light-transmitting area.

3,696,716
IDENTIFICATION CARD CAMERA SYSTEM CAPABLE OF PRODUCING CARDS HAVING DIFFERENT FORMATS
John F. Pasieka, Acton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Oct. 8, 1969, Ser. No. 864,632
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 30 Claims



A camera system which employs an objective lens-shutter element to form an image of a subject positioned exteriorly of the camera on a sheet of photographic material and an arrangement including another lens and a plurality of mirrors, one of which mirrors is pivotably mounted in the optical path between the first mentioned lens and the sheet of photographic material, for forming an image of a data card mounted interiorly of the camera on the same sheet of photographic material. An arrangement, including a polarizing plate adapted to overlie the sheet of photographic material, restricts the light rays intersecting a first area of such material to those from the subject and the light rays intersection a second area of such material to those from the data card. The section of the polarizing plate overlying the first such area has its transmission axis orthogonally aligned with that of the section of the polarizing plate adapted to overlie the second such area. This plate is mounted in the system so as to be replaceable with other such plates on which the separate polarized sections thereof differ in location and/or size. The aforementioned pivotably mounted mirror is adapted to be displaced out of such optical path to facilitate photographing the subject. Other features are included so that when a button is depressed by the operator, a rotating cam first effects the displacement of the polarizing plate against the sheet of photographic material, energizes a data card flash unit, rotates the mirror and finally activates the shutter associated with the subject optics.

3,696,717
APPARATUS FOR PRINTING RAILWAY TICKETS AND THE LIKE
Tsutomu Honma; Tatsuya Yamada; Toshihide Kawashima, all of Kawasaki-shi; Hideo Amano, Tokyo-to; Mamoru Mizuguchi, Kawasaki-shi; Suekichi Inomata, Yokohama-shi; Toshihiko Oguchi, Kawasaki-shi; Hiroshi Nakano, Yokohama-shi; Jiro Nagata; Shuji Takao, both of Kawasaki-shi; Takao Nishihara, Tokyo-to; Takao Sudo, Kawasaki-shi, and Teiji Tomita, Kamakura-shi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki-shi, Japan
Filed Oct. 14, 1969, Ser. No. 866,201
Claims priority, application Japan, Oct. 17, 1968, 43/75264; Oct. 17, 1968, 43/75265; Oct. 17, 1968, 43/75266; Oct. 17, 1968, 43/75267; Oct. 17, 1968, 43/75268; Oct. 17, 1968, 43/75269; Oct. 26, 1968, 43/78065; Oct. 31, 1968, 43/79426; Nov. 27, 1968, 43/86360; Nov. 27, 1968, 43/86361; Dec. 3, 1968, 43/88042; Dec. 3, 1968, 43/88043; Dec. 3, 1968, 43/88044
Int. Cl. B21b *13/00*
U.S. Cl. 95—4.5 R 8 Claims



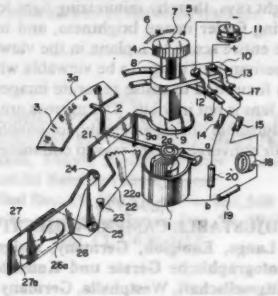
Originals containing ticket information are disposed on a continuously rotating carrier 16. Marks on the carrier designate different originals. A flash lamp 20 is used to illuminate a first set of originals which correspond to a type of ticket information, and flash lamp 25 illiminate a second set of originals which correspond to other ticket information.

A lamp 81 is used to remove latent charge from the edge of the ticket caused by residual charge left on the belt 6.

3,696,718
EXPOSURE ADJUSTING DEVICE IN A CAMERA
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan
Filed Dec. 1, 1970, Ser. No. 93,959
Claims priority, application Japan, Dec. 1, 1969, 44/114527
Int. Cl. G03b *7/12*
U.S. Cl. 95—10 C 4 Claims

A exposure adjusting device in a camera making use of an ammeter, wherein in a camera which automatically controls the exposure on the basis of deflection angles of the pointer of said ammeter, in accordance with the brightness of an object, and wherein the manual exposure is controlled manually adjusting the pointer position against the returning tendency of said ammeter pointer, the engagement between the ammeter

pointer and exposure selection member, in the manual exposure condition, is ensured by impressing a voltage, of opposite



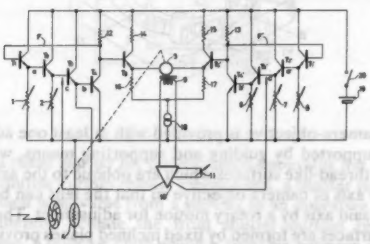
polarity to that of the automatic exposure control on said ammeter when adjusting the exposure selection member for manual exposure.

3,696,719

AUTOMATIC EXPOSURE CONTROL DEVICE

Kinji Tanikoshi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1971, Ser. No. 116,029
Claims priority, application Japan, Feb. 26, 1970, 45/16748
Int. Cl. G03b *9/06, 19/18*
U.S. Cl. 95—10 CD 7 Claims



In the device disclosed, a first amplifier is composed of a plurality of cascaded emitter follower stages. A photoelectric transducer serves as an input by being connected as one emitter load. An inverting stage in the amplifier feeds the output at the last emitter follower to the first to compress input signals. A second amplifier is composed of a plurality of cascaded emitter follower stages. Each stage includes an emitter circuit in the form of a variable resistor that can be set on the basis of photographic information and provide a separate input. An inverting stage in the amplifier feeds the output of the last emitter follower to the first to compress the input signals. A comparator compares the outputs of the amplifiers. Driving means responsive to the comparator adjust the diaphragm in front of the transducer.

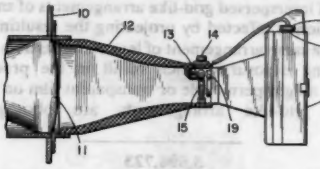
3,696,720

METHOD AND APPARATUS FOR PHOTOGRAPHING OSCILLOSCOPE TRACES WITH CONVENTIONAL CAMERA

Billy H. Vinson, San Diego, Calif., assignor to Integrated Controls, Inc.

Filed Aug. 11, 1971, Ser. No. 170,723
Int. Cl. H01j *29/06*; G02f *1/28*; G03b *27/76*
U.S. Cl. 95—10 C 6 Claims

A hood structure incorporating a close-up lens and a specific light source whose intensity may be varied serves to support a conventional camera in front of an oscilloscope screen for photographing an oscilloscope trace. The hood blocks ambient light from the camera and the specific light source in the hood controls the exposure of the camera such as the shutter speed and/or the f-stop opening by causing this light source to shine on the photocell and by varying its intensity. Since the invention permits the use of a conventional



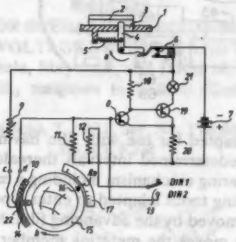
camera, the entire apparatus is extremely economical for photographing oscilloscope traces.

3,696,721

AUTOMATIC DISTANCE WARNING CIRCUITS FOR CAMERAS TO BE USED WITH PHOTOFLASH UNITS

Karl Wagner, Ottobrunn, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 19, 1971, Ser. No. 116,757
Claims priority, application Germany, Feb. 27, 1970, P 20 09 267.5
Int. Cl. G03b *17/18*
U.S. Cl. 95—11 R 16 Claims



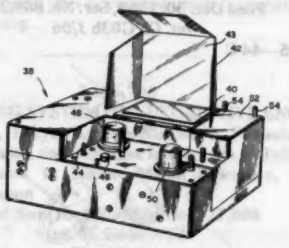
A voltage divider connected to the base of one transistor of a trigger stage has the ratio changed in dependence on the setting of the focusing ring. When the distance is too small or too great to adequately expose a photoflash picture, the trigger stage switches, causing a lamp to light up as a warning to the user.

3,696,722

PHOTOGRAPHIC RECORDING AND REPRODUCTION APPARATUS

Gordon Lysle, Greenlawn, and Ronald Bonagura, East Meadow, both of N.Y., assignors to Photosystems Corporation, Plainview, N.Y.

Filed Oct. 6, 1969, Ser. No. 870,471
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 R 12 Claims



An apparatus for the recording and reproduction of an image by zonal reduction. For recording an image, the image is segmented into a plurality of zones, each of which is photographically reduced and recorded, the recording being effected in a grid-like arrangement of reduced recording zones. This reduction is effected by the use of a plurality of lens elements constituted by a masked arrangement of two perpendicularly related lenticular screens. Recording is effected on a

photographic film which is supported by an arrangement capable of displacing the same along multiple coordinates so that a plurality of images can be sequentially recorded as a plurality of interspersed grid-like arrangements of small areas. Reproduction is effected by projecting the resulting product through the same arrangement of lens elements as is employed in obtaining exposures which result in the product. The product is a light-permeable or transparent film on which the aforesaid grid-like arrangements are photographically produced.

3,696,723

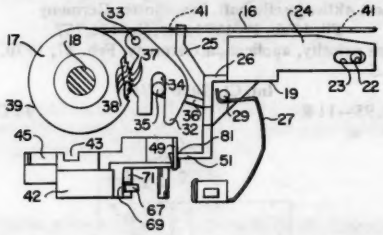
CAMERA WITH METERED FILM ADVANCE AND DOUBLE EXPOSURE PREVENTION

Paul J. Ernisse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1969, Ser. No. 802,864

Int. Cl. G03b *1/62, 9/68, 17/42*

U.S. Cl. 95—31 FM **6 Claims**



A camera adapted for use with film having metering perforations at predetermined intervals therealong, is provided with a film metering mechanism including a metering member having a metering tooth adapted to enter a perforation in the film and to be moved by the advancing film. Movement of the metering tooth moves the metering member to an operative position wherein the metering mechanism blocks further advance of the film. Manual depression of a trigger operating element effects withdrawal of the metering tooth from the film perforation and permits return of the metering member to an inoperative position under spring bias. Return movement of the metering member drives a control member which actuates the camera shutter drive mechanism and locks the trigger operating element in a depressed position. Movement of the metering member to its operative position drives the control member to cock the shutter drive mechanism and unlock the trigger operating element for movement from its depressed position.

3,696,724

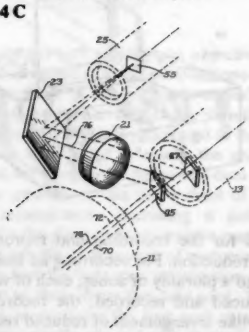
DUAL BEAM RANGEFINDER

Rudolf Hartmann, Skokie, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 30, 1969, Ser. No. 889,212

Int. Cl. G03b *3/06*

U.S. Cl. 95—44 C **8 Claims**



A rangefinder system is mounted in a camera with a viewfinder system and an objective lens having an afocal lens portion and a prime lens portion between which a pair of light reflecting members, such as mirrors, are mounted offset from the optical axis of the objective lens, so as to not intersect the film image light rays, thereby minimizing light loss to the film and maximizing finder image brightness, and to reflect light rays from the entire scene to a plane in the viewfinder system causing a superimposed image to be viewable when the objective lens is in focus and to cause separate images to be viewable when the lens is not in focus. The mirrors are supported on structures, adjustable during assembly, for enabling correction of divergent or convergent light rays to collimated rays.

3,696,725

ADJUSTABLE CAMERA-OBJECTIVE

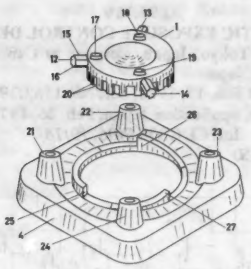
Karl Heinz Lange, Ennigloh, Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft, Westphalia, Germany

Filed Dec. 31, 1969, Ser. No. 889,667

Claims priority, application Germany, March 6, 1969, P 19 11 372.5

Int. Cl. G03l *3/02*

U.S. Cl. 95—45 **8 Claims**



A camera-objective is provided with at least one adjustable lens supported by guiding and supporting means, which engages thread-like surfaces which are oblique to the axis of lens or the axis of camera objective so that the lens can be shifted along said axis by a rotary motion for adjustment. The thread-like surfaces are formed by fixed inclined planes provided with cam notches, which are engaged by at least one detent provided on said guiding means, so that stepped shift movement of the adjustable lens along the axis of the camera objective is possible, by the detent dropping into one notch after the other notch when a predetermined force of rotation, transferred to the adjustable lens is exceeded.

3,696,726

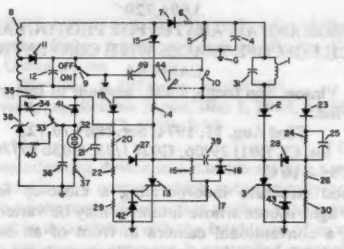
SHUTTER OPERATING SYSTEM

Donald E. Lewis, Canandaigua, N.Y., assignor to Ilex Optical Company, Inc., Rochester, N.Y.

Filed Jan. 21, 1969, Ser. No. 792,561

Int. Cl. G03b *7/02, 9/62*

U.S. Cl. 95—53 EA **17 Claims**



A solenoid-actuated camera shutter is timed by an SCR multivibrator. For relatively-short exposure times, the mul-

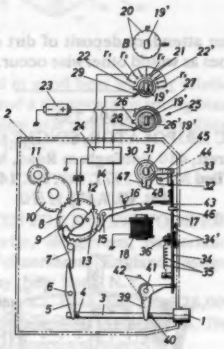
tivibrator is operated monostably, and exposure time is selected by adjusting the time constant of the monostable mode. Bistable multivibrator operation provides for exposure time selection independent of the multivibrator.

3,696,727

PHOTOGRAPHIC APPARATUS WITH ELECTRICALLY OPERATED FOCAL PLANE SHUTTER

Junichi Yokozato, Tokyo, Japan, assignor to Zenza Bronica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1969, Ser. No. 886,568
Claims priority, application Japan, Dec. 24, 1968, 43/94431
Int. Cl. G03b 9/28
U.S. Cl. 95—57 **4 Claims**



A focal plane shutter for photographic apparatus has front and rear shutter curtain release mechanisms, a shutter release device which is movable from a starting to an operative position to thereby actuate the front shutter curtain release mechanisms, a selector knob which is turnable between a first position to thereby set the shutter for bulb exposure operation and several additional positions to thereby set the shutter for operation with different preselected exposure times, an electric circuit including an electromagnet which is deenergized with a preselected delay following depression of the release device to thereby cause or permit actuation of the rear shutter curtain release mechanism and which remains deenergized in the first position of the selector knob because the electric circuit is then deenergized by a contactor which rotates with the selector knob, and an actuating device which actuates the rear shutter curtain release mechanism in response to movement of the release device back to its starting position while the selector knob dwells in the first position. The consumption of energy is reduced to zero when the selector knob dwells in such first position because the circuit of the electromagnet is then deenergized.

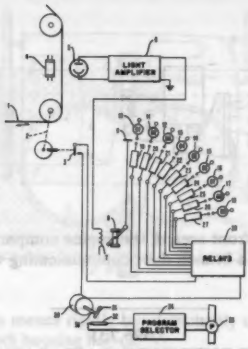
3,696,728

FILM PROCESSOR

Stephen F. Hope, 195 Welsh Road, Huntington Valley, Pa.

Filed Dec. 19, 1969, Ser. No. 886,488
Int. Cl. G03d 3/00
U.S. Cl. 95—89 **7 Claims**

In a film processor the replenishment pump is controlled by a single related to the accumulated measurement of light density of the developed film. Intermittently, in response to each one inch of travel of the film, a time delay circuit produces an electrical signal having a time duration related to the measured density of the film. Density measurements are accumulated in a servo motor rotated by the electric signal. For each revolution of the servo motor, a program selector energizes



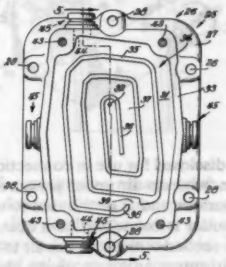
the replenishment pump for a time duration selected in accordance with the type of film being processed.

3,696,729

BREATHER FOR OPERATING MECHANISM HOUSING FOR HIGH VOLTAGE SWITCHES AND THE LIKE

Leonard V. Chabala, Maywood, and David M. Evans, Wheeling, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Sept. 7, 1971, Ser. No. 178,093
Int. Cl. F24f
U.S. Cl. 98—1 **13 Claims**



Mechanism housing for out of door high voltage switches which breathe as a result of a change in atmospheric conditions are provided with labyrinths through which the ambient air flows and in which water, airborne corrosive compounds, and dust are trapped, thus preventing them from entering the mechanism housing.

3,696,730

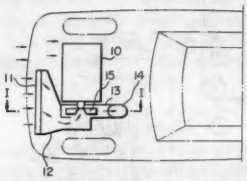
AIR COOLING SYSTEM OF AUTOMOTIVE ENGINE

Tetuzo Masuda, Tokyo; Kenjiro Kurosawa, Fukuoka-machi; Takeo Hashimoto, and Takahisa Izumi, both of Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 18, 1969, Ser. No. 877,808
Int. Cl. B60h 1/24
U.S. Cl. 98—2.06 **1 Claim**

A cooling arrangement for an automotive internal combustion engine having a crankshaft oriented rectangular to the longitudinal direction of the motor vehicle, which system includes a radiator positioned in front of the engine compartment and vented from the open air, a duct communicating at one end with the radiator and opened at the other to the open air in a direction rectangular to the longitudinal direction of

the vehicle, and a fan provided in the duct and driven by the crankshaft of the engine. The radiator may cover an either



total or partial front area of the engine compartment and the duct may have a branch duct communicating with the occupants' room.

3,696,731

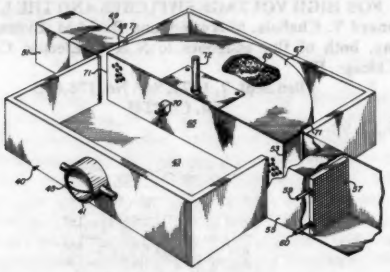
AIR DISTRIBUTING APPARATUS

Richard D. Tutt, Tucson, Ariz., assignor to Lear Siegler, Inc., Krueger Division

Filed March 29, 1971, Ser. No. 128,794

Int. Cl. F24f *11/04*

U.S. Cl. 98—41 **8 Claims**



Apparatus is disclosed for use in connection with an air distribution system, wherein air under pressure is supplied to an inlet to the apparatus and is distributed to either of two outlets. The first outlet is connected to a duct for delivery to a room, while the second outlet supplies air to the system return plenum. The air enters an air receiving chamber of the apparatus and is directed toward a wall positioned substantially transversely to the direction of air entering the chamber. The wall is rotatably mounted within the chamber and is positioned to rotate from a first position to a second position where the wall shrouds either the first inlet or the second inlet. Positioning of the wall between the first and second positions results in the proportioning of the air to the first and second outlets; the areas of the outlets are thus reduced in proportion to the reduction in the volume of air to be delivered through the inlet. The wall may comprise a perforated sheet having holes therein to admit audible pressure variations through the holes to a sound deadening chamber positioned immediately behind the wall. The volume thus delivered by the apparatus remains constant for any rotatable position of the wall.

3,696,732

MOTOR VEHICLE WITH AIR FLOW DEFLECTOR

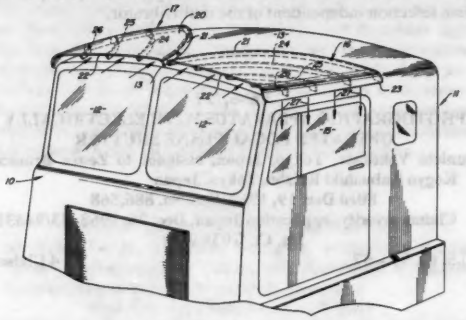
John J. Rodgers, South Euclid, Ohio, assignor to White Motor Corporation, Cleveland, Ohio

Filed Dec. 29, 1969, Ser. No. 888,621

Int. Cl. B60h *1/24*

U.S. Cl. 98—2.14 **15 Claims**

A truck cab has a ram air scoop structure extending across its top to receive air moving upwardly along the front of the cab and direct it downwardly alongside the cab windows so as to minimize turbulence adjacent the windows and inhibit the rise of dirt-laden air from the road to the region adjacent the



windows and an attendant deposit of dirt and dirty water on the windowpanes as would otherwise occur.

3,696,733

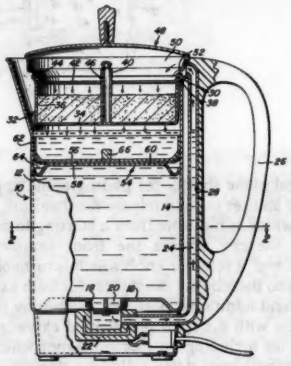
AUTOMATIC DRIPOLATOR, SINGLE COMPARTMENT

James H. Beverett, 410 Nottingham Road, Montgomery, Ala.

Filed May 6, 1971, Ser. No. 140,707

Int. Cl. A47j *31/10*

U.S. Cl. 99—307 **8 Claims**



A single cycle coffee maker incorporating a vertically sliding separator which divides a single compartment coffeepot into upper and lower chambers. The lower chamber receives the water which is pumped upwardly and discharged through the coffee grains into the upper chamber. The separator rides downwardly on the decreasing water level in the lower chamber, increasing the capacity of the upper chamber as the brewed coffee builds-up therein. The separator is solid and a side pump or delivery tube is utilized.

3,696,734

COMMERCIAL WAFFLE BAKER

Silas V. Beasley, Elgin, Ill., and Norman Beam, Macon, Mo., assignors to McGraw-Edison Company, Elgin, Ill.

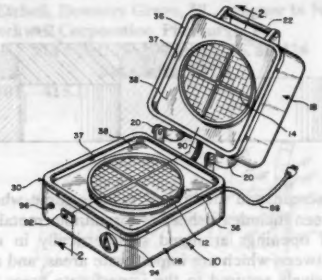
Filed July 8, 1971, Ser. No. 160,781

Int. Cl. A21b *5/02*

U.S. Cl. 99—331 **10 Claims**

A waffle baker where rectangular base and cover case components support circular waffle grids within opposing smooth heated faces defining thereby a heated spill over area annularly adjacent the grids for collecting and solidifying spillage for easy cleaning; where bolts are extended completely through the case component and threaded into taps on the un-

derside of the grid to leave exposed actuating tool heads for easy removal of the bolts and grids without otherwise disassembling the baker; and where a sheath type electric resistance heating element bent to shape is held removably



within a fixture and in good heat transfer relationship against the grid underside and a thermostat is spring biased against the grid underside to allow grid removal and replacement without recalibration of the baker.

3,696,735

APPARATUS FOR FRYING FOOD PIECES

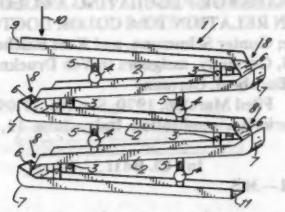
Arie Leendert Boertje, Hoogeveen, Netherlands, and Peter John Philpott, Felmersham, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 13, 1968, Ser. No. 776,007

Claims priority, application Netherlands, Nov. 13, 1967, 6715386

Int. Cl. A47j *37/12*

U.S. Cl. 99—404 **1 Claim**



Food pieces are fried in an apparatus comprising a plurality of downwardly sloping straight channels, so arranged in zigzag fashion that frying oil along with buoyant pieces of foodstuff transfer from the exit end of each channel in free fall to the inlet end of the succeeding channel, reversing direction at this point and turning over the pieces of foodstuff. The oil flows at shallow depth, and the apparatus has guides at the points of transfer to insure smooth flow of oil with minimum turbulence.

3,696,736

WORM HOUSING FOR DOUBLE WORM PRESS

Hans Studli, Winterthur-Hard, Switzerland

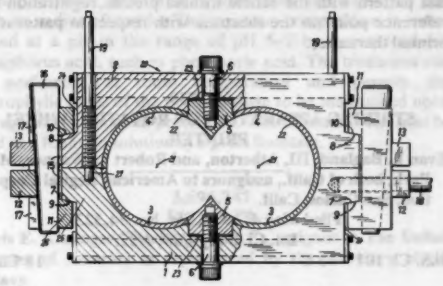
Filed March 29, 1971, Ser. No. 128,860

Claims priority, application Switzerland, April 1, 1970, 4806/70

Int. Cl. B30b *3/04*; B29b *3/08*

U.S. Cl. 100—146 **8 Claims**

A worm housing construction for a double worm press of the type equipped with wearing sleeves, wherein both the housing and the wearing sleeves are sub-divided in the plane of the worm axes into two halves, key connection means being provided at both longitudinal sides of the housing halves, such



key connection means rigidly but detachably connecting with one another both housing halves.

3,696,737

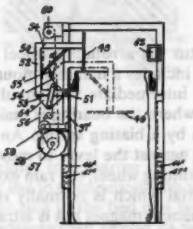
APPARATUS FOR PACKAGING REFUSE AND OTHER MATERIALS

Karl Gustav Wikner, Hallgumsgatan 33C, Kramfors, Sweden

Filed Dec. 15, 1969, Ser. No. 884,951

Int. Cl. B30b *7/00*

U.S. Cl. 100—233 **3 Claims**



An apparatus for packaging refuse, trash or other waste products that are deposited into a receptacle such as a paper bag, from a chute. Provided at the outlet end of the chute is a compacting or pressure-exerting device which includes a pressure plate mounted to be moved into and out of the bag through its open mouth at required intervals to compact or compress the materials that are deposited in the bag.

3,696,738

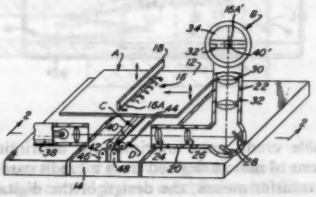
SILK SCREEN STENCIL APPARATUS AND METHOD

Howard R. Walker, Aldan, Pa., assignor to Joseph E. Podgor, Inc., Pennsauken, N.J.

Filed Feb. 3, 1971, Ser. No. 112,245

Int. Cl. B41f *17/08*, *15/00*

U.S. Cl. 101—38 **4 Claims**



Apparatus and method for silk screening a microscopic pattern on a stencil into precise registration with reference in-

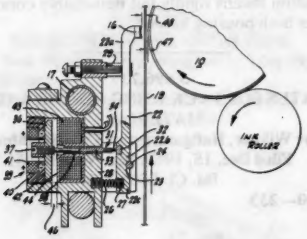
dicia previously incorporated upon a substrate. System includes an optical comparator with a reticle which magnifies the images and after superimposing a reference point in the test pattern with the reticle insures precise registration of a reference point on the substrate with respect to patterns imprinted thereafter.

3,696,739

STRIKING APPARATUS FOR ROTATING WHEEL PRINTER

Evan L. Bagland, III, Atherton, and Robert L. Wagner, Menlo Park, both of Calif., assignors to American Regital Corporation, San Carlos, Calif.

Filed May 4, 1970, Ser. No. 34,323
Int. Cl. B41j *9/00, 1/22*
U.S. Cl. 101—93 C **10 Claims**



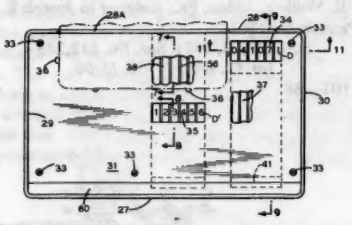
Striking apparatus for a rotating wheel printer where the striking apparatus includes a hammer mounted on one end of a lever having an intermediate semicircular bearing portion mated with a pin where the bearing is maintained in engagement with the pin by a biasing spring. An exciter includes a ram for impacting against the lever to move the hammer into contact with the printing wheel, the ram extending from a disc of magnetic material which is normally retained in the rest position by a permanent magnet but is attracted by a cup-core type electromagnet for causing the exciter to impact the lever to rotate the hammer into contact with the printing wheel.

3,696,740

TRAVELING CYLINDER PRINTER WITH SELECTIVE INDICIA ON ENDLESS BANDS

Otto G. Glatt, 29 B Addison Place, Clifton, N.J.

Filed Aug. 20, 1971, Ser. No. 173,561
Int. Cl. B41j *1/16*; B41f *3/20*
U.S. Cl. 101—111 **10 Claims**



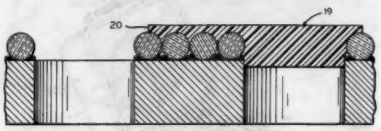
A portable credit card imprinter for imprinting selected combinations of indicia derived from a credit card and digital character transfer means; the design of the digital character transfer means being such as to thereby materially reduce the bulk, thickness and weight thereof and to thus enhance the portability thereof.

3,696,741

FORAMINOUS PRINTING SCREEN

George W. Reinke, P.O. Box 143, Cary, Ill.

Filed Dec. 3, 1969, Ser. No. 881,700
Int. Cl. B41n *1/24*; G03c *5/06*
U.S. Cl. 101—128.3 **4 Claims**



Printing screen and method of making same wherein the printing screen includes a sheet of foraminous metal having a plurality of openings arranged symmetrically in rows and columns between which are imperforate areas, and a layer of beads adhesively secured to the imperforate areas to define the printing side of the screen.

3,696,742

METHOD OF MAKING A STENCIL FOR SCREEN-PRINTING USING A LASER BEAM

Leo P. Parts, Dayton, and Edgar E. Hardy, Kettering, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Oct. 6, 1969, Ser. No. 864,161
Int. Cl. B41c *1/14*
U.S. Cl. 101—128.4 **7 Claims**

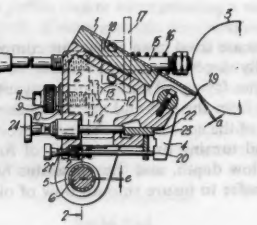
An improved metal screen-printing stencil in which the non-printing areas are closed with a solid polymer capable of undergoing residue-free depolymerization. The process of producing the stencil in which printing areas are opened by irradiation with a laser beam.

3,696,743

APPARATUS FOR REGULATING A COLOR DOSING DEVICE IN RELATION TO A COLOR DOCTOR ROLLER

Hans Johne; Gunter Schumann, and Kurt Reichenberger, all of Radebeul, Germany, assignors to Veb Druckmaschinenwerk Planeta, Badebeul, Germany

Filed March 6, 1970, Ser. No. 17,094
Claims priority, application Italy, June 11, 1969, 52198 A/69
Int. Cl. B41f *31/04*
U.S. Cl. 101—365 **7 Claims**



Apparatus for controlling a color dosing device in relation to a color doctor roller wherein the entire color dosing device, under retention of the support line between the color knife and the color profile lever is pivotable about a fulcrum point for the purpose of setting the color slot, characterized in that for the purpose of changing the blade angle or clearance the entire color dosing device is pivoted about the fulcrum point without changing the color slot and the fulcrum point is shifted a distance corresponding to the change in the color slot whereby the individual color profile levers which act on the edge of a color knife are separately pivoted for setting the

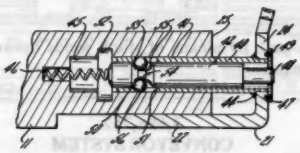
color profile and all of the color profile levers are jointing pivoted for parallel setting of the color knife and color profile storage.

3,696,744

SADDLE LOCKUP FOR FLEXIBLE PRINTING PLATE

Gordon Etcheli, Downers Grove, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Oct. 13, 1970, Ser. No. 80,426
Int. Cl. B41f 27/12
U.S. Cl. 101—415.1 10 Claims



A curved saddle for supporting and tensioning a flexible printing plate which has a series of closely spaced appertures along opposite edge portions. Each end of the saddle is provided with a circumferentially moveable spring biased bar having a series of spaced lugs over which opposite ends of the appertured plate may be positioned and secured. To facilitate positioning of the plate over the bar lugs, each bar has a locking mechanism which secures the bar in a retracted position upon manually moving the bar to that position. After a plate is secured to the bar, the locking mechanism may be readily released by depressing an actuating plunger, thereby permitting the bar to be urged under the spring biasing force to an outwardly extended plate tensioning position.

3,696,745

COMPOSITE OFFSET PRINTING PLATE

Jay Morton, 3301 N. E. 5th Avenue, Miami, Fla.

Filed Jan. 22, 1971, Ser. No. 108,916
Int. Cl. B41f 1/28
U.S. Cl. 101—415.1 1 Claim

A composite printing plate for application to the plate cylinder of an offset printing press comprised of a base plate and frame strips secured to the top surface of the base plate providing a plurality of framed openings for the reception of respective single page or other page segment sized lithographic printing plates, each printing plate being sized and shaped to be received within the confines of its respective framed opening and to be removably attached to the top surface of the base plate by adhesive means in such a manner so as to be removable from the base plate, while said base plate is fixed to the plate cylinder, for replacement by a newly prepared lithographic printing plate.

3,696,746

DESENSITIZING NON-FERROUS LITHOGRAPHIC PRINTING PLATES WITH AQUEOUS PHOSPHATE GLASS COMPOSITIONS

James E. Harper, 6040 Haverhill Street, Oxon Hill, Md.

Filed April 24, 1969, Ser. No. 819,110
Int. Cl. B41m 5/00; B41n 3/00; B41m 1/00
U.S. Cl. 101—465 7 Claims

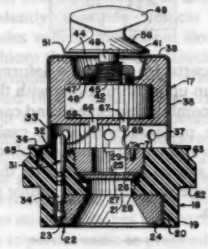
Non-ferrous lithographic printing plates, and especially those in which the hydrophobic image areas are constituted by photosensitive polymers, are desensitized by application to the metal surface of the developed plate of an aqueous desensitizing solution comprising a phosphate glass such as sodium hexametaphosphate, preferably in admixture with a fluoride salt, such as sodium fluoride. The aqueous composition is maintained at a pH in the range of pH 5–7 by a water-soluble phosphorus acid, such as phosphoric acid. The treatment can be performed at room temperature and permits the hydrophylic areas of the printing plate to be maintained upon storage without special protection. The treatment can also be used as a fountain solution in a press fountain.

3,696,747

FLOODER

Lewis E. Kissinger, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 3, 1952, Ser. No. 297,193
Int. Cl. B63f 3/00
U.S. Cl. 102—10 9 Claims



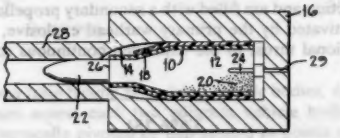
The invention relates to a marine mine and more particularly to a device for use in connection with a submersible body to cause the body to sink to the bed of a body of water at the expiration of a predetermined period of time after the body has been planted in a body of water.

3,696,748

MEANS FOR IMPROVING BURNOUT OF CONSUMABLE CARTRIDGE CASES

Jean P. Picard, Morristown; William O. Seals, Budd Lake, and Lawrence W. Pell, West Orange, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Continuation-in-part of Ser. No. 659,562, Aug. 2, 1967, abandoned. This application Dec. 29, 1969, Ser. No. 888,664
Int. Cl. F42b 5/18, 5/30
U.S. Cl. 102—38 1 Claim

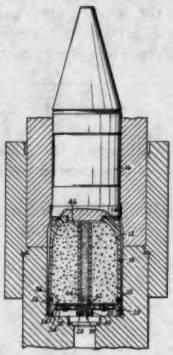


A weapons system for promoting the complete combustion of a consumable cartridge case used therewith. The system includes means for uniformly radially spacing the cartridge case from the breech or chamber wall of the gun chamber which permits the circulation of hot gases therebetween.

3,696,749
EXPENDABLE CASE WITH VENTED BASE CAP

John J. Scanlon, Monroe, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Nov. 18, 1969, Ser. No. 877,747
Int. Cl. F42b *13/28, 5/00*
U.S. Cl. 102—49.7 10 Claims

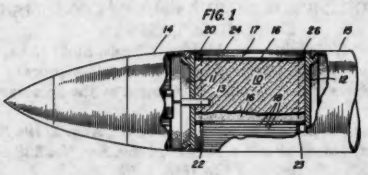


An expendable cartridge wherein a deformable casing is expelled from the gun upon firing along with the projectile. The substantially non-combustible breech end cap is vented so that the full explosive pressure within the casing does not act against the breech end cap and thus expulsion of the casing is facilitated. Cover means are mounted on the breech end cap to provide environmental portection and/or protection against accidental ignition.

3,696,750
ROD WARHEAD

Stirling A. Colgate; Marvin L. Kempton; Merle E. Hanson; William O. Munson, and Dallas E. Nicholson, all of Socorro, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 21, 1967, Ser. No. 649,415
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 10 Claims



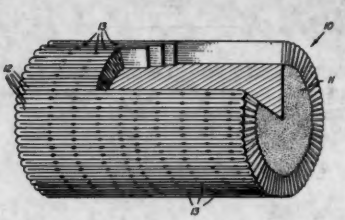
A continuous rod warhead wherein each rod is of a comparatively small cross-section and is capable of achieving extremely high ribbon velocities. The rods are V-shaped in cross-section and are filled with a secondary propellant which, when activated by the primary warhead explosive, produces an additional thrust to the expanded continuous rod projectile.

3,696,751
ROD WARHEAD

Marvin L. Kempton, Socorro, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 21, 1967, Ser. No. 656,627
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 3 Claims

A continuous rod warhead whose rods are rectangular in cross-section and are disposed in a bundle edge-on towards the target. Edge-on attitude is maintained throughout the

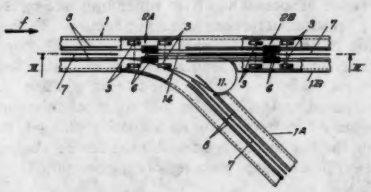


rods' flight path by means of stitch welds between the rods near the hinges.

3,696,752
CONVEYOR SYSTEM

Michel Bourg, Neuilly S/Seine, France, assignor to Frankel-Industries, Seine and Marne, France

Filed Sept. 12, 1969, Ser. No. 857,378
Int. Cl. B60l *9/00*; B60m *1/30*
U.S. Cl. 104—148 LM 3 Claims

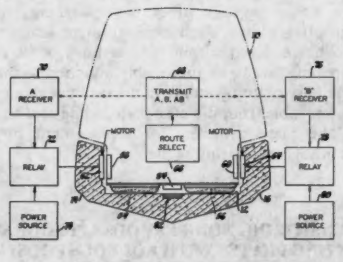


A conveyor system having tracks supporting a carriage having two spaced and wheeled units, each unit including a linear motor, at least one motor being connected at all times to a source of electrical potential.

3,696,753
GUIDEWAY AND SWITCHING LINEAR MOTOR PROPELLED VEHICLE

Howard R. Ross, Grosse Pointe Woods; Lloyd D. Goodrich, Grosse Pointe Park, and Norman McQueen, Bloomfield Hills, all of Mich., assignors to Transportation Technology, Inc., Madison Heights, Mich.

Filed Oct. 29, 1969, Ser. No. 872,020
Int. Cl. B60l *9/18*; B60n *1/00*; B61b *13/08*
U.S. Cl. 104—148 LM 7 Claims



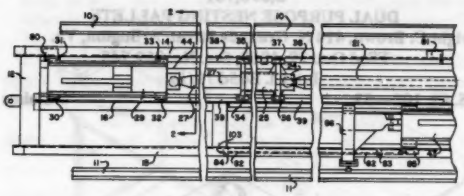
A vehicular transportation system including a guideway having lateral walls of ferromagnetic material and linear induction motors on the opposite sides of the vehicle to provide propulsion thrust and selective magnetic attraction to the walls. To negotiate a route fork, the motors on one side are deenergized so the vehicle follows the wall on the other side.

3,696,754

VARIABLE-STROKE CAR SHIFTING APPARATUS

Charles M. Anderson, and Edward H. Ratcliff, Jr., both of Paris, Ky., assignors to W. R. Stamler Corporation, Paris, Ky.

Filed Dec. 29, 1969, Ser. No. 888,597
Int. Cl. B61j 3/08
U.S. Cl. 104—162 10 Claims



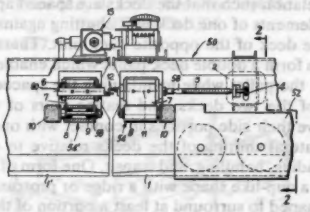
A car shifting apparatus for moving cars of different lengths includes axle-engaging dogs and a sensor mechanism actuated by a car wheel for controlling the respective engagements and disengagements of the dogs with the appropriate axles of the cars. Telescopic fluid pressure motors serve to advance and to retract the dogs through strokes which are dependent upon the distances between successive trucks of the cars as reflected by the action of the sensor mechanism.

3,696,755

BLOCKING MECHANISM FOR AN OVERHEAD CRANE TRACKWAY

Fred Wiggershaus, Silschede, and Klaus Donner, Hohenlimburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed April 22, 1970, Ser. No. 30,818
Claims priority, application Germany, July 17, 1969, P 19 36 385.4
Int. Cl. B61k 7/00
U.S. Cl. 104—250 1 Claim



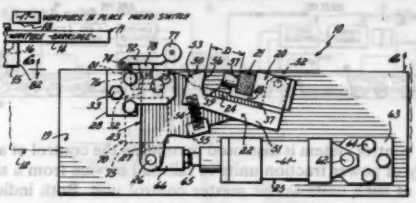
A device for blocking the movement of a movable crane on an overhead trackway when it comes to the end of the trackway includes a mechanism mounted at the end of the trackway and supporting a buffer arm having a buffer end portion thereon which is alignable with the trackway over which a crane is movable in order to block the movement of the crane toward the end of the trackway. The arrangement includes a motor drive for pivoting the buffer arm about an axis which is substantially parallel to the longitudinal axis of the trackway for the purpose of shifting the buffer arm from a position at which it blocks the moving crane to one at which it is removed from a blocking position to permit traveling movement of the crane from one trackway to another trackway which is aligned therewith. The adjacent trackway is adapted to have a similar buffer construction with a pivot lever element which is exposed when the two trackways are aligned in a position such that actuation of one buffer arm to move it out of a blocking position will be effective to move the other buffer arm of the adjacent trackway out of a blocking position.

3,696,756

CAR RETAINING CUSHIONED LATCH MECHANISM

Clifford L. Elmore, Cincinnati, and Richard C. Young, Oregonia, both of Ohio, assignors to Teledyne Mid-American Corporation, Los Angeles, Calif.

Filed Feb. 1, 1971, Ser. No. 111,332
Int. Cl. B23q 5/22; B61k 7/08, 7/18
U.S. Cl. 104—251 13 Claims



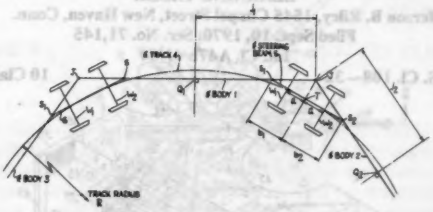
A cushioned latch mechanism for use with a workpiece transfer system of the type wherein a workpiece is carried along a track from one work station to another, while seated on an independently movable vehicle or carrier. The mechanism includes vehicle movement slowing and stopping means which cushions the stop of the vehicle at a work station or other predetermined position, and a latch which blocks rebound movement of the vehicle from the stop point and thereafter holds it in predetermined position. The stopping means and the latch are both mounted on a common movable member which is movable between (a) a vehicle engaging position where the stopping means and latch stop and lock the vehicle at the predetermined position, and (b) a retracted position where the stopping means and latch are moved out of the vehicle's path to permit same to proceed past the predetermined position.

3,696,757

DAMPENED RAILWAY CAR TRUCK

Michael Newman, and David Boocock, both of London, England, assignors to British Railways Board, London, England

Continuation-in-part of Ser. No. 849,322, Aug. 12, 1969, abandoned. This application March 31, 1971, Ser. No. 129,899
Claims priority, application Great Britain, Aug. 20, 1969, 39,818/68
Int. Cl. B61f 3/12, 5/24, 5/38
U.S. Cl. 105—4 R 6 Claims



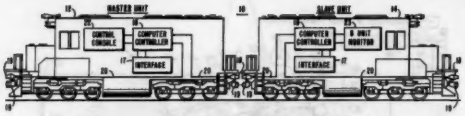
A railway train having articulated vehicle bodies. A steering beam spans across each two adjacent vehicle bodies. Each beam is vertically pivoted or ball-jointed at points along the longitudinal center line of the adjacent vehicle bodies at some distance from the end of each vehicle body. The steering beam acts as a structure to which a suspension unit (bogie truck) is attached. The suspension unit is attached to the beam in a manner which permits the suspension unit to rotate in yaw about a vertical axis. The yaw rotation may be accomplished either freely or against the restraint of springs, viscous dampers or friction devices.

3,696,758

LOCOMOTIVE SIGNALING AND CONTROL SYSTEM

Peter A. Godinez, Jr., West Covina, Calif., assignor to Genisco Technology Corporation, Compton, Calif.

Filed Dec. 18, 1969, Ser. No. 886,295
Int. Cl. B61g 1/08; B61c 3/00
U.S. Cl. 105—61 21 Claims



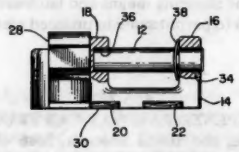
A control system is disclosed permitting the control of a plurality of power traction units in railroad service from a single one of such units as the master control unit. Both indicator and command signaling are provided between the various units by means of inductive couplers mounted in the vicinity of the mechanical unit couplers. Frequency shift keying and redundant signal encoding are employed to provide a high degree of reliability with protection against failure and errors.

3,696,759

TIE-DOWN FITTING

Peter P. Parris, Tustin, Calif., assignor to Tridair Industries, Redondo Beach, Calif.

Filed March 9, 1970, Ser. No. 17,659
Int. Cl. B60p 7/08; B61d 45/00
U.S. Cl. 105—369 A 2 Claims



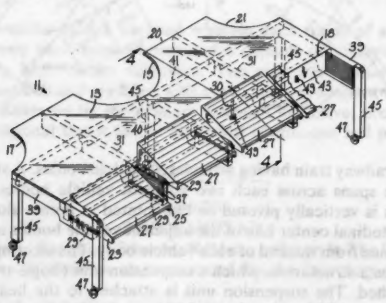
A tie-down fitting having a removable pin that passes through an attachment loop formed in the end of a tie-down strap so that the tie-down can be replaced in the field without cutting the loop or without cutting and resewing the stitching in the loop.

3,696,760

LEARNING TABLE

Jefferson B. Riley, 1545 Chapel Street, New Haven, Conn.

Filed Sept. 10, 1970, Ser. No. 71,145
Int. Cl. A47b 41/04
U.S. Cl. 108—32 10 Claims



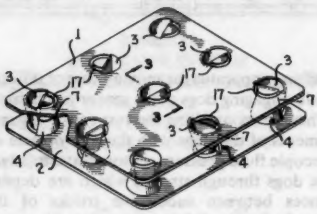
A modular classroom table for cooperating in the promotion of a formal and an informal learning environment, comprising a plurality of inclined desk surfaces disposed along a first edge of a horizontal top panel, which desk surfaces may be independently raised or lowered to fit the individual student. Another edge of the top panel is provided with a plurality of cutouts which, when complementing cutouts of one or more of other cutouts of the tables in modular arrangements, define geometrical figures such as circles and semi-circles.

3,696,761

DUAL PURPOSE NESTING PALLETS

Dwight C. Brown, 414 N. Granada Street, Arlington, Va.

Filed Oct. 27, 1969, Ser. No. 869,748
Int. Cl. B65d 19/18
U.S. Cl. 108—53 6 Claims



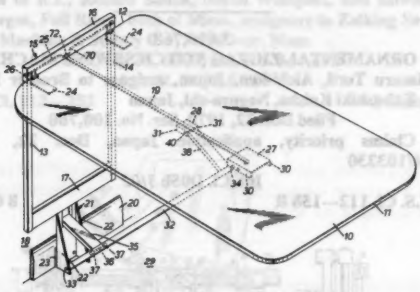
A pallet is used for supporting and transporting a load in either a single deck pallet form, or a double deck pallet form which includes a pair of the single deck units. Each single deck unit includes a deck having a side adapted to receive a load and an underside from which a plurality of spaced hollow support elements project. The single deck units are identical to each other such that the support elements of one deck unit will mate with the support elements of any other deck unit when the deck units are not in use, to permit storage of two or more deck units in overlying relation by registering and nesting the support elements of one within the support elements of the other. Two single deck units may also be placed in back-to-back relation such that the decks are spaced apart with the support elements of one deck unit abutting against the underside of the deck of the opposite deck unit. Thereby, the two deck units form a double deck pallet which enables support of a load on the pallet while maintaining the spaced apart relationship of the two decks, and mating pairs of support elements have their side portions in contact with one another to prevent lateral shifting of the decks relative to one another during loading, handling, and transit. One form of support element has a cup-like shape with a ridge or protrusion adjacent thereto shaped to surround at least a portion of the end of the respective support element on the opposite deck when the two single deck units are assembled in double deck pallet configuration. This secures and interlocks the two single deck units together to further reduce the possibility of lateral shifting. Fasteners having components integral with one or both of the decks are used to secure the two units together in the vertical double deck pallet configuration. In another embodiment, the two deck units differ from one another, in that only one has projecting support elements, the other having holes in the deck, and ridge pockets arranged to receive the projecting elements of the first. Deck units having a plurality of open U-shaped support elements attached to the underside of the respective deck in runner support configuration can be secured and interlocked together in the double deck pallet assembly by use of individual longitudinal members which are inserted through the aligned U-shaped elements when the decks are in back-to-back configuration. In still another form, the support elements may be aligned on individual runners and the runners alone used in single deck or double deck pallet configuration.

3,696,762

FOLDABLE PLATFORM DEVICE

Bertram Roy Holdham, Eastleigh, England, assignor to Polydesigns Limited

Filed June 24, 1969, Ser. No. 835,967
Int. Cl. A47b *3/00*
U.S. Cl. 108—134 17 Claims



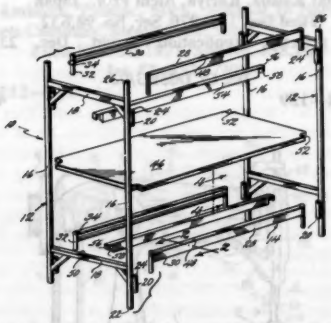
The invention provides a foldable platform device comprising a platform having an end for linear guidance by a guideway between an out-of-use position of the platform and an in-use position of the platform, a guideway for so guiding said platform end, a support member for the platform which support member will extend between the platform and a platform support and will move with the platform between the platform out-of-use and in-use positions, and biasing means operatively connected to the support member for having a controlling influence over movement of the platform between its out-of-use and in-use positions.

3,696,763

STOCK RACK

John D. Evans, Rocky Mount, N.C., assignor to Metals, Inc., Rocky Mount, N.C.

Filed May 4, 1970, Ser. No. 34,456
Int. Cl. A47b *3/06*
U.S. Cl. 108—157 10 Claims



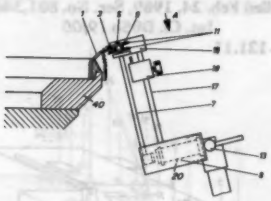
A knock-down stock rack including a pair of upright standards having tubular socket members secured thereto and connected by means of longitudinally extending support members having downwardly extending dowels which are telescopically received in the socket members, the stock rack having a rectangular shelf seated upon the support members for maintaining the posts in rectangular alignment.

3,696,764

APPARATUS FOR THE IMPALING OF WEFT-KNITTED AND WARP-KNITTED GOODS ON NEEDLES

Eberhardt Merkle, Stuttgart-Vaihingen, Germany, assignor to Wilhelm Bleyle KG, Stuttgart, Germany

Filed May 8, 1969, Ser. No. 822,993
Claims priority, application Germany, July 17, 1968, P 17 60 903.9
Int. Cl. D05b *7/00*
U.S. Cl. 112—25 6 Claims



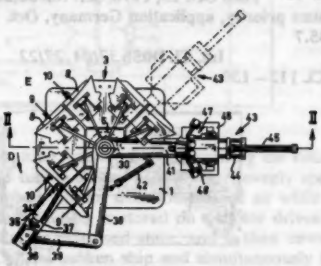
Apparatus for the mechanical impaling of weft-knitted and warp-knitted goods on needles of knit-goods machines which includes a pair of rollers having peripheral grooves gripping around the needle heads. The rollers are adapted to act on the goods to be impaled and are arranged so as to have their grooves gripping the needles consecutively with one roller ahead of the other roller in the working direction. The first roller has a groove of less depth than the groove of the second roller to narrowly grip the extremity of each needle. In turn, the second roller has a wider groove than the groove of the first roller adapted to the curvature of the needle and the thickness of the goods. Vibration means are provided to vibrate the rollers in a direction substantially parallel to the longitudinal axis of the needles and the rollers are axially shiftable on their axles.

3,696,765

APPARATUS FOR TRIMMING AND CLIPPING THE EDGES OF TEXTILE FABRIC CUTS

Horst Bernewasser, Steinhagen, Germany, assignor to Kochs Adler AG, Bielefeld, Germany

Filed Aug. 11, 1970, Ser. No. 62,887
Claims priority, application Germany, Aug. 14, 1969, P 19 41 423.4
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 11 Claims



An apparatus for trimming and clipping the edges of textile fabric cuts, particularly collar cuts of men's shirts after joining together for the purpose of preventing the formation of material accumulation at the points and other places of the collars after these are turned over. The trimming and clipping apparatus, suitable for use in an automatic sewing device having a rotary table, is disposed on a supporting arm pivoted about the axis of the rotary table is fed to the rotary table and taken along by the same within a section of its angle of rotation. After the cutting and clipping operations are completed,

the trimming and clipping apparatus is disconnected from the rotary table and brought automatically into the starting position.

3,696,766

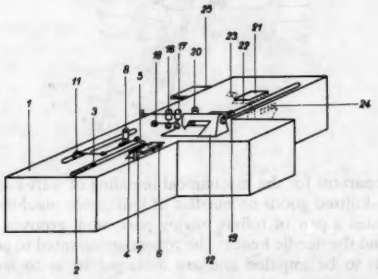
METHOD OF AND APPARATUS FOR FOLDING, SEWING AND CONVEYING SHEET MATERIALS

Günthard Glasow; Klaus Grosse; Knut Hykel; Werner Schleifer; Eberhard Karste, and Helmut Kliehe, all of Berlin, Germany, assignors to Veb Wtz Fur Bekleidungstechnik, Berlin, Germany

Filed Feb. 24, 1969, Ser. No. 801,346

Int. Cl. D05b *19/00*

U.S. Cl. 112—121.11 **6 Claims**



A method of and apparatus for folding and conveying sheet materials. A work support is provided having a work surface. Sheet material blanks are engaged by engaging means and advanced along the work surface while being maintained in a predetermined orientation with respect to a folding device to which they are transported. The folding device folds the sheet materials in a predetermined manner and the folded blank is then advanced again along the work surface to a processing station where it is engaged and moved with respect to a processing device according to a predetermined program while being acted upon by the processing device. Subsequently the thus-produced processed article is engaged and removed from the processing device to be stacked and counted.

3,696,767

INTERSECTING DEVICE FOR SEWING MACHINES

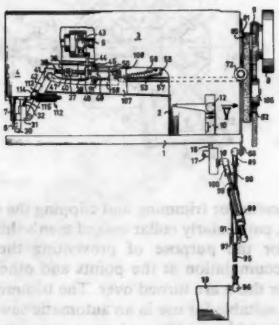
Gunter Landwehr, Sennestadt, Germany, assignor to Kochs Adler AG, Bielefeld, Germany

Filed Oct. 13, 1970, Ser. No. 80,285

Claims priority, application Germany, Oct. 15, 1969, P 19 51 845.7

Int. Cl. D05b *37/04, 27/22*

U.S. Cl. 112—130 **9 Claims**



An intersecting device for sewing machines for intersecting the edges of a workpiece at a right angle to the feeding direction and in predetermined intervals during sewing by means of a reciprocating blade. Means are provided for disconnecting the blade during the operation, in the starting position of the sewing machine or for disconnecting the blade during sewing with a reverse feed. The device is provided with a permanently vertically displaceable blade which can be forced into engagement with a counterknife by means of a driven control disk having control paths and determining the cutting intervals.

3,696,768

ORNAMENTAL ZIGZAG STITCH SEWING MACHINE

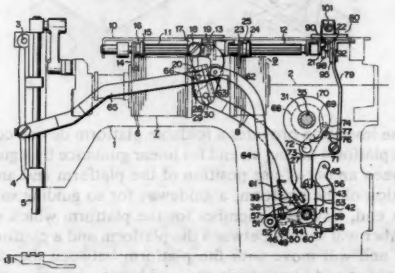
Masaru Torii, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya-shi, Japan

Filed Dec. 22, 1970, Ser. No. 100,760

Claims priority, application Japan, Dec. 22, 1969, 44/103230

Int. Cl. D05b *3/02*

U.S. Cl. 112—158 R **8 Claims**



An ornamental zigzag stitch sewing machine comprising zigzag pattern and feed controlling cams which respectively allow a needle to be laterally oscillated and a feed dog to be controlled in the length and direction of feed, the movements of the needle and feed dog being simultaneously adjusted by single manually operable means to produce ornamental zigzag patterns in various sizes similar to that of a base pattern.

3,696,769

BASTING STITCH MECHANISM FOR HOUSEHOLD ZIGZAG SEWING MACHINE

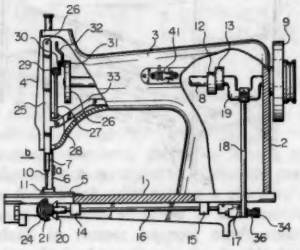
Oshio Sawada, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed Dec. 16, 1970, Ser. No. 98,632

Claims priority, application Japan, Dec. 23, 1969, 44/103980

Int. Cl. D05b *3/02*

U.S. Cl. 112—159 **4 Claims**



A zigzag sewing machine equipped with mechanism in which an eccentric is utilized in connection with the shuttle driving mechanism to vary cooperation of the shuttle with the needle for selectively preventing the interlocking of the first and second threads respectively carried by the needle and the

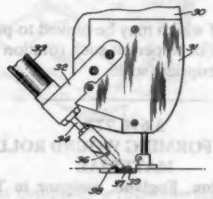
shuttle, whereby a skip stitch may be obtained to provide a greatly spaced stitches likely to meet the requirement of basting stitches.

3,696,770

THREAD CUTTING ATTACHMENT FOR A SEWING MACHINE

Owen F. Dunne, Tiverton; William E. Hebert, Portsmouth, both of R.I.; Ronald Souza, North Westport, and Edward Wargat, Fall River, both of Mass., assignors to Zalking Sewing Machine & Supply Co., Fall River, Mass.

Filed July 24, 1969, Ser. No. 844,451
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 **2 Claims**



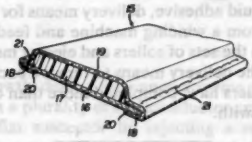
The invention comprises a thread cutter for a sewing machine. The cutter comprises a block of material having a plurality of sides, each side providing a different cutting edge. This permits the cutter to be moved to another edge when the first edge becomes dull. In accordance with the present invention the block of material is mounted in a weighted holder which is in turn mounted at the end of a piston rod slidable in and out of an air cylinder. A backing plate is provided against which the cutter is forced by the air cylinder with a sudden burst of air. The optimum angle at which the particular cutting edge meets the backing plate is an angle of 19°. At this angle the cutter operates virtually without a miss. Experiment has indicated that the cutter will operate at a variance of plus or minus four degrees with reasonable efficiency. The cutter is operated by a conventional type of tripping circuit in which a piece of cloth entering the machine trips a sensing device which causes the cutter to operate in front of and at the rear of the cloth to trim the threads.

3,696,771

DECORATIVE SEAT WELT

Jere B. Ambrose, Pontiac, Mich., assignor to Northern Fibre Products Company, Birmingham, Mich.

Filed June 21, 1971, Ser. No. 155,161
Int. Cl. B32b *7/08*
U.S. Cl. 112—417 **2 Claims**



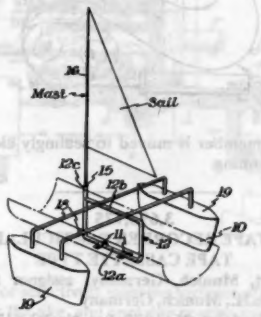
A decorative seat welt for securement to the upholstry fabric covering automobile-type seats, formed of a long, narrow strip of thick, double creped paper upon which is centered a thicker strip of resilient foam plastic material, covered by a cloth-like strip. The side edges of the foam strip are spaced a short distance inwardly from the side edges of the paper strip, and the side edges of the cloth-like strip are bent around the side edges of the paper strip to overlap the edge portions of the rear face thereof. A line of stitches arranged closely adjacent to each of the side edges of the plastic strip secures the edges of the cloth-like and paper strips together. The assembled welt is then stitched to the upholstry cloth covering the seat, for decorative purposes.

3,696,772

BOAT STABILIZER-SAILING RIG

Allen O. Sundelin, 16D Thomas Drive, Monroe Park, Wilmington, Del.

Filed Oct. 6, 1970, Ser. No. 78,405
Int. Cl. B63b *35/00*
U.S. Cl. 114—39 **4 Claims**



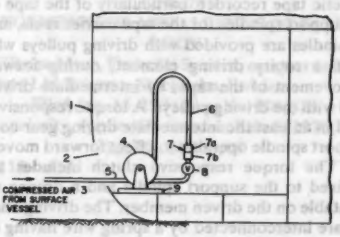
Boat stabilizer-sailing rig wherein the mast is free to move arcuately transverse the boat in fixed relationship with associated outrigger stabilizers as the attitude of the stabilizers changes responsive to the wind action on the sail.

3,696,773

METHOD FOR SALVAGE OF SUNKEN SHIPS

Ross E. Morris, Vallejo, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 23, 1970, Ser. No. 100,945
Int. Cl. B21d *19/00*
U.S. Cl. 114—54 **4 Claims**



A method of raising sunken ships comprising the filling of "lay-flat" plastic tubing having a uniformly, evenly spaced, longitudinally ribbed interior with compressed air while submerged. The plastic tubing is stored on a motor driven reel device, in the flat or collapsed state, and is then unwound within the hull of the sunken ship and simultaneously filled with compressed air.

3,696,774

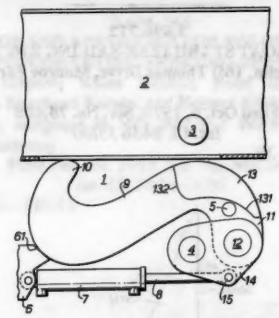
BATTENING SYSTEM FOR HATCH COVERS

Halvor Ostrem, Skarer, Norway, assignor to Kvaerner Brug A/S, Oslo, Norway

Filed Nov. 3, 1970, Ser. No. 86,542
Claims priority, application Norway, Nov. 4, 1969, 4363/69
Int. Cl. B63b *19/14*
U.S. Cl. 114—203 **2 Claims**

An S-shaped hook engages, at one end, a peg on a hatch

cover and, at a distance from that end, is pivotally connected to the hatch coaming and also connected to a power source so



that the hook member is moved to sealingly close the hatch cover to the coaming.

3,696,775

MAGNETIC TAPE RECORDER PARTICULARLY OF THE TAPE CASSETTE TYPE

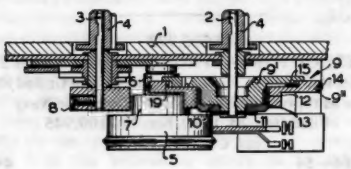
Ernst Markart, Munich, Germany, assignor to Sud-Atlas-Werke G.m.b.H., Munich, Germany

Filed Oct. 26, 1970, Ser. No. 83,817

Claims priority, application Germany, April 21, 1970, P 20 19 050.5

Int. Cl. G08b *3/00*

U.S. Cl. 116—67 A **9 Claims**



A magnetic tape recorder, particularly of the tape cassette type, has support spindles for the tape carrier reels, and these support spindles are provided with driving pulleys which are coupled to a rotary driving element, during forward and reverse movement of the tape, by intermediate driving gear connected with the driving pulleys. A torque responsive clutch is included in at least the intermediate driving gear connected to the support spindle operable to effect forward movement of the tape. The torque responsive clutch includes a driven member fixed to the support spindle and a driving member freely rotatable on the driven member. The driving and driven members are interconnected by a spring wire having one end conformingly fitted in a slot in one member and the other end extending into an annular recess in the other member and bent to engage detent recesses in the other member. When the two members slip over each other, they form an acoustic signal device warning that the tape has been completely unwound from one or the other of the two tape carrier reels.

3,696,776

DIAL ASSEMBLIES

Gerald A. P. Waplington, Colchester, England, assignor to Gamet Products Limited, Hythe, Colchester, England

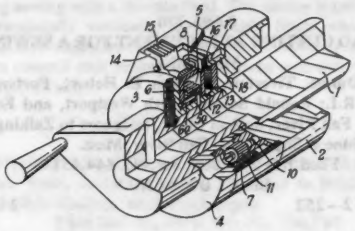
Filed Jan. 19, 1970, Ser. No. 3,918

Claims priority, application Great Britain, Jan. 30, 1969, 5,192/69

Int. Cl. B23q *17/00*

U.S. Cl. 116—115.5 **6 Claims**

A dial assembly for use on a machine tool to enable readings to be taken selectively on the Imperial or Metric scales of measurement, including two gear wheels having the appropriate conversion ratio and a pinion in constant mesh with both gear wheels, a pinion carrier frictionally driven by a shaft



and a clutch, part of which may be moved to prevent rotation of the pinion carrier or to permit such rotation with attendant revealing of the appropriate scale.

3,696,777

MACHINES FOR FORMING WOUND ROLLS OF SHEET MATERIAL

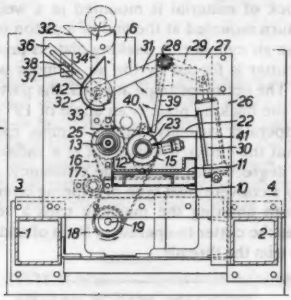
Robert Preen, Clifton, England, assignor to T. H. Dixon & Company Limited, Letchworth, Hertfordshire, England

Filed Aug. 29, 1968, Ser. No. 756,250

Claims priority, application Great Britain, Aug. 29, 1967, 39,467/67

Int. Cl. B05c *1/02*

U.S. Cl. 118—5 **14 Claims**



The invention is concerned with securing the tails or free ends of rolls of sheet material by applying to the outside of each roll at least one annular band of a liquid adhesive and is described in the specification with reference to a preferred form of machine for use with newly wound logs of toilet tissue which are to be cut up into standard size rolls. This machine essentially comprises two sets of rollers, one set of which dip into a tray of liquid adhesive, delivery means for receiving logs one at a time from a winding machine and feeding them into the nip between the sets of rollers and ejector means operative in unison with the delivery means to remove each log from the nip after the rollers have completed more than one revolution in contact therewith.

3,696,778

BREADING MACHINE

George A. Moore, 843 North Dellrose, Wichita, Kans.

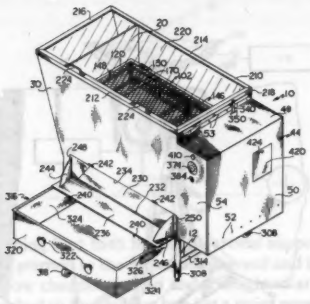
Filed Nov. 17, 1969, Ser. No. 877,299

Int. Cl. A23g *3/26*

U.S. Cl. 118—9 **9 Claims**

A machine for breading pieces of fish, meat, such as cut chicken, and the like, which comprises a perforated container for the pieces mounted for rotation about a horizontal axis in an open-topped housing having a lid, such container means having an access opening normally closed by a latchable

cover. A timer controlled power means is provided for rotating the container means, with means also being provided for disabling the power means when the lid is not closed. A hopper feeds breading into the housing, and the power means is coupled to a breading agitator in the hopper. The preferred



container means comprises a rotatable receptacle in which a perforated basket is removably received, with the cover of the receptacle, when latched, retaining the basket in the receptacle. The housing has a closable discharge opening in its front through which breading can be discharged into a drawer that is extensible forwardly from beneath the housing.

3,696,779

VAPOR GROWTH DEVICE

Tsuyoshi Murai, Kokubunji, and Tatsuo Toi, Koganei, both of Japan, assignors to Kokusai Denki Kabuskiki Kaisha, Tokyo-To, Japan

Filed Dec. 21, 1970, Ser. No. 100,115
Claims priority, application Japan, Dec. 29, 1969, 45/1599
Int. Cl. C23c *11/08*
U.S. Cl. 118—48 **6 Claims**

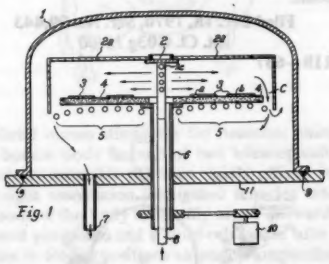


Fig. 1

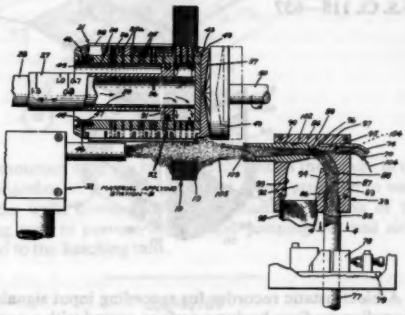
A vapor growth device for vapor-growing semiconductor crystal films on a plurality of semiconductor crystal wafers arranged on a flat susceptor by injecting a reaction gas of semiconductor compound comprises a metal chamber, a nozzle pipe extending into the chamber and having at the top portion thereof a plurality of holes to inject the reaction gas along directions parallel with the flat suscepter; and a nozzle cover having a flat part and a cylindrical part provided at the edge of the flat part connected to the top of the nozzel pipe at the flat part so that the nozzle cover and the suscepter provide a reaction chamber having a gap between the cylindrical part and the edge of the suscepter, whereby the reaction gas injected in the reaction chamber from the nozzle pipe flows through the gap in the form of a gas curtain and then out an exhaust hole of the metal chamber.

3,696,780

APPARATUS FOR APPLYING POWERED COATING MATERIAL TO AN ARTICLE

Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company

Continuation-in-part of Ser. No. 802,795, Feb. 27, 1969, abandoned. This application Nov. 25, 1969, Ser. No. 879,664
Int. Cl. B05b *7/14*
U.S. Cl. 118—69 **11 Claims**



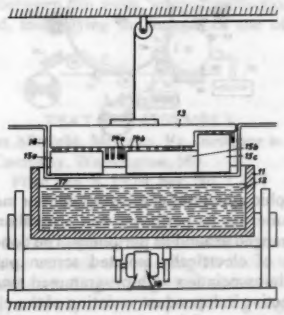
Apparatus for selectively masking surfaces of various length stator cores or the like, and applying coating material to other selected surfaces with a fluidic controlled coating nozzle. A circumferential series of ribs on a core support structure sandwich ported pads which pass coolant fluid to the selected core surfaces to prevent coating material buildup on the core. The ported pads are provided with laterally extending grooves at spaced longitudinal locations along their outer surface to restrict conductive heat transfer longitudinally therealong. Insulation between the ribs and pads restrict the conductive transfer of heat from the pads to the ribs. Fluid control signals to the coating nozzle selectively direct coating material through the nozzle to the other core surfaces or return the constantly flowing coating material to the pulverant coating material storage and supply area.

3,696,781

ARRANGEMENT FOR METALLIZING OF PARTS OF A BODY

Oskar Wilhelm More, Enskede, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 15, 1971, Ser. No. 106,826
Claims priority, application Sweden, Feb. 5, 1970, 1490/70
Int. Cl. B05c *3/09*
U.S. Cl. 118—425 **2 Claims**



Apparatus for metallizing parts of a body by dipping into molten metal includes a plurality of part vessels or dip tanks

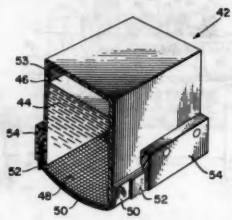
with different heights and widths so chosen in accordance with the parts of the body to be metallized.

3,696,782

ELECTROSTATIC RECORDER

Robert G. McConnell, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 772,306, Oct. 31, 1968, Pat. No. 3,634,867. This application Oct. 22, 1970, Ser. No. 83,255
Int. Cl. B05c *3/00*
U.S. Cl. 118—637 2 Claims



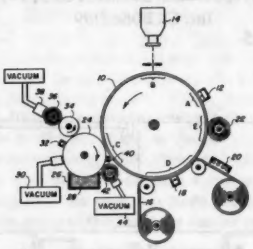
A electrostatic recorder for recording input signals upon a recording medium having a surface coated with a conductive, electrostatically chargeable material is shown including an electrostatic charging device of the corona discharge type for evenly charging the coated surface of the recording medium. The charged surface is exposed to focused electromagnetic radiation which is transversely displaced across the recording medium for discharging the exposed portion thereof in accordance with the input signal to be recorded. The recording medium is then coated with a suspension fluid containing toner particles applied across the full surface thereof by an applicator arranged as a squeegee. The toner particles are attracted to the electrostatic charge gradient formed between the electrostatically charged surface of the recording medium and the discharged portion thereof.

3,696,783

AUTOMATED TOUCHDOWN DEVELOPEMENT SYSTEM

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1970, Ser. No. 98,372
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 10 Claims



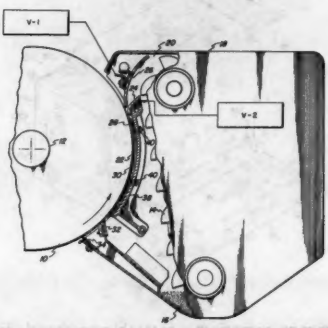
Xerographic apparatus employing a donor member adapted to retain toner on its periphery and a number of processing stations arranged around its periphery. The donor member has a plurality of electrically isolated screen patterns thereon which are in association with programmed means adapted to permit selective independent variation of the electrical potential of one or more of the screen patterns within the range of ground potential to charge potential as the donor member surface is transported past the several processing stations.

3,696,784

XEROGRAPHIC DEVELOPMENT APPARATUS

Marshall Benson, East Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1970, Ser. No. 98,374
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 5 Claims



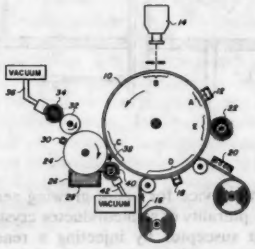
This invention relates to an electroded cascade development system wherein an extended electrically conductive electrode plate is closely spaced from a xerographic surface being developed. The xerographic surface is moved in an uphill direction against the direction flow of the cascading developer. The electrode is completely insulated electrically from its surrounding whereby it is electrically floating with respect to ground and the image bearing surface for improved development of latent electrostatic images developed under its influence.

3,696,785

DEVELOPMENT APPARATUS

Paul G. Andrus, Powell, Ohio, assignor to Xerox Corp., Stamford, Conn.

Filed Dec. 18, 1970, Ser. No. 99,443
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 4 Claims



Xerographic development apparatus employing a donor member adapted to retain toner on its periphery and a number of processing stations arranged around its periphery, including a loading station having means to load toner on the peripheral surface of the donor member, and a toner layer preparation station having means to prepare the toner layer on the donor member prior to presentation of the toner layer to the imaged region of a photoconductor.

3,696,786

SELF-CLEANING BIRD BATH

Moody Ray Garwood, 781 Kiwana Drive, Youngstown, Ohio

Filed April 23, 1971, Ser. No. 136,942
Int. Cl. A01k *15/00, 29/00*
U.S. Cl. 119—1 5 Claims

A self-cleaning bird bath having a vertical support stand, a shallow bowl pivoted to the upper end thereof and incorporating an overflow channel therein and a weighted area. A container is attached to the shallow bowl at a point opposite to the weighted area and in a position to receive water from the overflow channel whereby water entering the overflow channel will be directed into the container so as to over balance the weighted area of the shallow bowl and cause the same to tip and discharge the contents thereof. Drain means in the container acts to empty the same whereby the shallow bowl returns to horizontal,normal position.

3,696,787

ARTIFICIAL RUMEN STIMULATOR

Cecil D. Cooper, 20161 Glendale Avenue, Lemoore, Calif.

Filed June 24, 1971, Ser. No. 156,404
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 8 Claims

An artificial rumen stimulator for ruminant animals which utilizes a hollow body formed of two telescopically and initially relatively rotatable portions rigidly affixed in adjusted and fluid-tight association, elongated tenacles integral with opposite ends of the body resiliently urged outwardly to radially disposed positions, and a fluid-releasable tube confining the tenacles in folded positions extended longitudinally along the body with the tenacles of the opposite ends of the body being in interlaced relation.

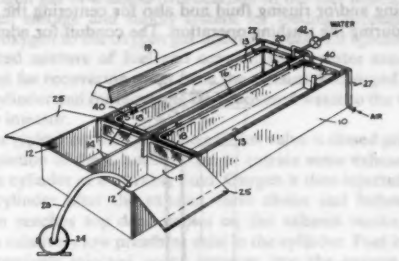
3,696,788

METHOD AND APPARATUS FOR HATCHING CRUSTACEA

John J. Day, and Paul S. Hirschman, both of Fort Lauderdale, Fla., assignors to Ocean Protein Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 887,814, Dec. 24, 1969. This application Dec. 8, 1970, Ser. No. 96,138
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 15 Claims

A tank apparatus and method for providing advantageous environment for the hatching and early development of crustacean larvae. A plurality of hatching chambers, each having an adjacent larval chamber, with a low bulkhead separating the larval chamber from the hatching chamber. Light sources near the larval chambers cause the larvae to migrate to the latter chambers when the water level is above the bulkhead and the screening is removed. A removable screen mesh



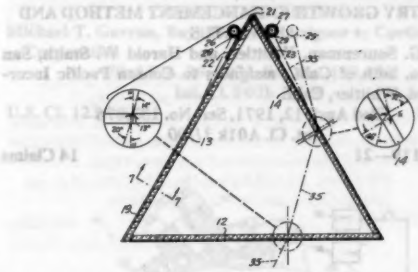
can be mounted atop the bulkhead to contain the larvae in the larval chamber. A spray arrangement is also provided to wash down the walls forming the larval chamber portion of the hatching tank to prevent larvae from jumping out and air is supplied to the hatching tank.

3,696,789

AQUARIUM WITH IMPROVED OPTICAL QUALITIES

Eugene D. Richard, 3664 Greinwich Boulevard, Lake Charles, La.

Filed Feb. 26, 1971, Ser. No. 119,267
Int. Cl. A01k *64/00*
U.S. Cl. 119—5 11 Claims



An aquarium of transparent material and of prismatic shape, provided with a vertical elongated lamp or lamps adjacent a rear corner, with an opaque shield between the lamps and the corner. Light rays from the lamps enter the aquarium through its walls and are refracted and dispersed, leaving the front wall in dispersed spectral form, thereby providing unusual prismatic rainbow effects. Because of the angular relationship between the walls, internal reflection effects are also provided, multiplying the images of the objects in the aquarium.

3,696,790

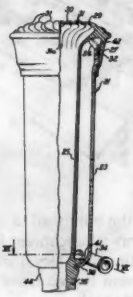
TEAT CUP ASSEMBLY

Penrose Lucas Albright, McLean, Va., assignor to Zero Manufacturing Company, Washington, Mo.

Filed Jan. 8, 1970, Ser. No. 1,457
Int. Cl. A01j *05/04*
U.S. Cl. 119—14.47 17 Claims

A flexible liner known as an inflation for a teat cup of a milking machine wherein the opening for receiving the cow's teat has radially extending corrugations about its edge so as to be expansible, such capacity to expand being augmented by a distensible knuckle spaced from and substantially parallel to the edge of the opening. In a preferred embodiment, the corrugations have a spiral configuration so as to form means

spaced from the opening for distending as the opening is expanded. The spiral corrugations serve a purpose of causing washing and/or rinsing fluid to swirl as it passes through the inflation whereby a more effective cleaning results. The shell for the inflation includes means at the upper edge for swirling the washing and/or rinsing fluid and also for centering the inflation during the washing operation. The conduit for admitting



air pulsations in the milking operation and washing fluid in the washing operation joins the shell at a tangent so as to direct washing and/or rinsing fluid into a helical swirling path in the annular space between the inflation and the shell. Optionally the shell may be convoluted to guide the fluid in a helical through the annular space and, further, to provide additional strength to the shell.

3,696,791

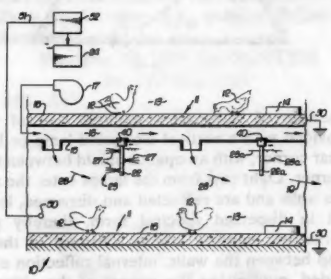
POULTRY GROWTH ENHANCEMENT METHOD AND APPARATUS

Donald G. Saurenman, Whittier, and Harold W. Smith, San Marino, both of Calif., assignors to Consan Pacific Incorporated, Whittier, Calif.

Filed April 12, 1971, Ser. No. 133,076

Int. Cl. A01k *31/00*

U.S. Cl. 119—21 **14 Claims**



A method of benefitting animals in a zone which characteristically contains air-borne particles includes:

a. confining the animals in the zone, and

b. dispensing ions into the zone with ion density and polarity to induce collection of the air-borne particles on collection surfaces in the zone.

3,696,792

PURPLE MARTIN BIRD HOUSE

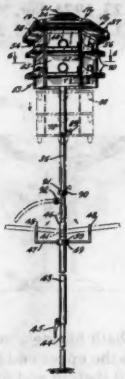
Robert Bruhns, 72 South Lake Drive, Leesburg, Fla.

Filed June 21, 1971, Ser. No. 154,972

Int. Cl. A01k *31/00*

U.S. Cl. 119—23 **8 Claims**

Apparatus for accommodating a plurality of nests for purple martins in which the apparatus includes a hollow exterior shell fixed to a post and selectively cooperating core telescopically mounted on the post for movement into and out of the shell to



facilitate ease of cleaning as well as apparatus which can be shipped in multiple independent parts and quickly assembled as an integral unit.

3,696,793

STEAM BOILERS

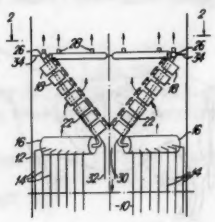
Alan Bell, London, England, assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Sept. 23, 1970, Ser. No. 74,761

Claims priority, application Great Britain, Aug. 6, 1969, 39,468/69

Int. Cl. F22b *1/02*

U.S. Cl. 122—4 D **7 Claims**



This invention relates to steam boilers fired by fluidized bed burners. A small proportion of bed particles are entrained by the fluidizing gases and so these must be removed by separators so as to ensure that these particles do not form deposits on downstream parts of the boiler. According to the invention a number of centrifugal separators are provided above the bed in the path of the fluidizing gas, those separators being supported and cooled by steam- or water-carrying tubes. Because effective cooling of the separators can be achieved, this arrangement has the advantage that they can be positioned closely above the bed.

3,696,794

STEAM GENERATING APPARATUS

Michael I. Kearns, 2207 Southern National Bank Building, Houston, Tex.

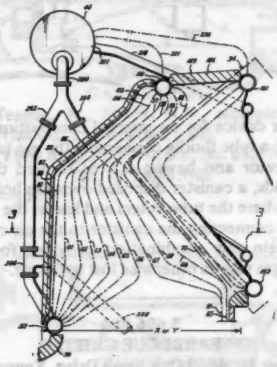
Filed Feb. 4, 1971, Ser. No. 112,622

Int. Cl. F22b *21/14*

U.S. Cl. 122—235 R **4 Claims**

Knockdown, prefabricated, steam generating apparatus includes a convection unit or boiler, one or more radiation units forming a furnace, and an unfired pressure vessel serving as a steam drum. The boiler includes upper and lower headers connected by front and rear banks of dog leg tubes forming a unit

of rectangular section adapted for transportation with such section coinciding with the right of way cross section, the boiler height lying diagonally therein, and the width of the boiler extending along the length of the right of way. The furnace includes an upper header from which extends a bank of tubes overlying the upper part of the front of the boiler, the tubes fanning out to greater spacing below the front of the boiler to form a slag screen, the bank then dividing into a front portion connecting to a front lower header and a rear portion



connecting to a rear lower header. The furnace is divided into a plurality of side by side units, each adapted for transportation with its height lying along the length of the right of way. A bank of return bend tubes located interiorly of the boiler between the front and rear banks of dog leg tubes forms a preheater having a lower manifold connected to a feed water pump and an upper manifold discharging to the steam drum. Downcomers connect the steam drum to the lower headers of the furnace and boiler and risers connect the upper headers of the furnace and boiler to the steam drum.

3,696,795

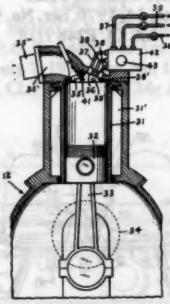
AIR POLLUTION-FREE INTERNAL COMBUSTION ENGINE AND METHOD FOR OPERATING SAME

Richard D. Smith, Palo Alto, and Dale A. Furlong, Sunnyvale, both of Calif., assignors to Combustion Power Company, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 59,571, July 30, 1970, which is a continuation-in-part of Ser. No. 796,089, Feb. 3, 1969, Pat. No. 3,608,660, and a continuation-in-part of Ser. No. 820,941, May 1, 1969, Pat. No. 3,608,529. This application Jan. 11, 1971, Ser. No. 105,172

Int. Cl. F02b *75/12*; F02d *19/00, 47/00*

U.S. Cl. 123—1 A **7 Claims**



An air pollution-free internal combustion engine and method for operating such engine are provided in which the engine has at least one cylinder, an exhaust port and exhaust valve, fuel, oxygen gas and water spray injectors, a piston in the cylinder, means for cyclically opening and closing the exhaust valve, a fuel storage and supply system for feeding hydrogen gas or a liquid hydrocarbon to the fuel injector, an oxygen storage and supply system for feeding substantially pure oxygen to the oxygen gas injector, means for igniting the injected mixture of fuel and oxygen, and a water recovery system for recovering water from the exhaust discharged from the cylinder and for recycling the recovered water to the water spray injector.

In a typical engine cycle, the exhaust valve is closed prior to completion of the exhaust stroke to entrain some exhaust gas in the cylinder as a working fluid. Oxygen is then injected into the cylinder after the exhaust valve closes and before the piston reaches top dead center on the exhaust stroke, and while relatively low pressures exist in the cylinder. Fuel is next progressively injected under pressure into the oxygen contained in the cylinder so that that fuel burns progressively as it is injected to preclude knocking problems. After combustion is substantially completed, the exhaust valve opens just before the piston reaches bottom dead center on the power stroke whereupon water is injected into the cylinder to cool the cylinder walls, piston, dome, combustion chamber wall and exhaust gas. A portion of the exhaust gas is then discharged from the cylinder through the exhaust port on the exhaust stroke.

Provision is made for operating the engine either in an air-pollution free mode using pure oxygen as the oxidant or a conventional mode using air as the oxidant.

3,696,796

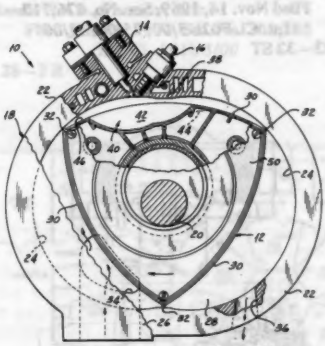
FUEL COMBUSTION IN A ROTARY PISTON INTERNAL COMBUSTION ENGINE

Michael T. Gavrun, Bayonne, N.J., assignor to Curtiss-Wright Corporation

Filed Feb. 26, 1971, Ser. No. 119,132

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.01 **10 Claims**



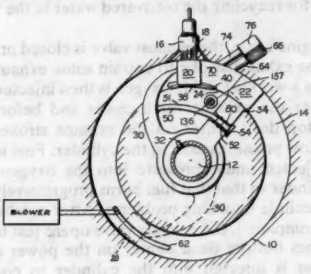
In a rotary piston internal combustion engine, a rotor having in each peripheral surface thereof a recess or pocket comprising a relatively large and deep depression and at least one relatively narrow and shallow channel communicating with and extending from the deep depression in the direction of rotor rotation. The channel defining, in the "waist" area of the engine housing, a "shooting" passageway which propels gaseous fluid in the working chamber at high velocity into the expansion working chamber for additional fuel combustion therein. The relatively large and deep recess provides, as the rotor rotates, high turbulence, residence time and volumetric space for mixing and flame propagation from the point of ignition.

3,696,797

TRAVELING CHAMBER INTERNAL COMBUSTION ENGINE

Warren W. Kessler, 25 West Oneida Street, Oswego, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,920
Int. Cl. F02b 53/00
U.S. Cl. 123—8.09 5 Claims



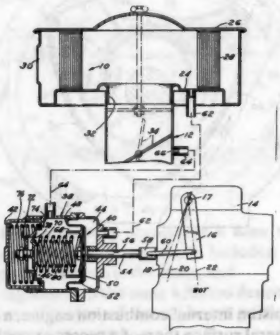
A rotary chamber for an internal combustion engine in which the chamber is defined as formed between two variously rotating members essentially by pivotally disposed arms between fixed walls for forming a rotating or traveling chamber in which the compressing of air into atomized fuel is injected for combustion initiated by spark discharge, and in which the combustion propels one of the pivotal arms about its support shaft, while the other arm is temporarily fixedly held in place, and in which the cycling of the operation of the internal combustion engine is accomplished electronically.

3,696,798

COMBUSTION PROCESS FOR ENGINE OF SPARK IGNITION, FUEL INJECTION TYPE

Irving N. Bishop, Farmington; Richard G. Mosher, Dearborn, and Aladar O. Simko, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1969, Ser. No. 876,717
Int. Cl. F02b 3/00, 75/00, 33/00
U.S. Cl. 123—32 ST 4 Claims



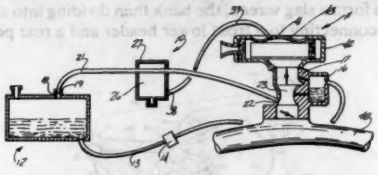
Process minimizes the production of undesirable elements in the engine exhaust by operating the engine with an overall rich mixture air/fuel ratio combustion without air throttling at full load operation, and a progressive fuel supply cutback as the load decreases without air throttling until a desired air-fuel ratio leanness is reached, at which point air throttling is introduced to maintain the air/fuel ratio constant regardless of further decrease in load.

3,696,799

GAS VAPOR DEVICE

Herbert M. Gauck, 2206 North 51st Street, Omaha, Nebr.

Filed Dec. 4, 1970, Ser. No. 95,137
Int. Cl. F02m 59/00
U.S. Cl. 123—136 3 Claims



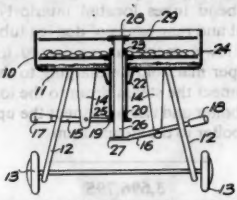
A gas vapor device for an internal combustion engine, the device having: a tube fluidly connecting the gas tank vent pipe to the carburetor and having a hole formed therein intermediate its ends; a canister disposed over the hole and sealed at the points where the tube enters and leaves the canister; and a hose fluidly connecting the canister to the air cleaner of the engine; wherein the combination provides for the direct utilization of gas vapors otherwise lost to the air.

3,696,800

BARBECUE GRILL

Arthur L. Close Jr., 4859 Oak Knoll Drive, Youngstown, Ohio

Filed Aug. 21, 1970, Ser. No. 65,846
Int. Cl. A47j 37/00; F24b 3/00
U.S. Cl. 126—25 A 4 Claims



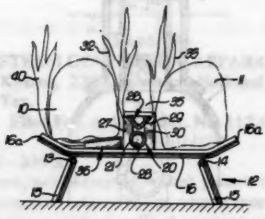
A barbecue grill having a bowl with a relatively flat bottom is provided with a pair of superimposed vertically movable grates normally positioned in spaced relation and above the bottom of the bowl. Telescopically arranged members support the grates and individual operating arms are arranged to impart movement to the telescopically arranged members so as to move the grates relative to one another and to the bowl.

3,696,801

LOG LIGHTER

Jack D. Whitehead, San Marino, Calif., assignor to International Products Inc., Pasadena, Calif.

Filed Dec. 14, 1970, Ser. No. 97,735
Int. Cl. F24b 1/18
U.S. Cl. 126—92 R 15 Claims



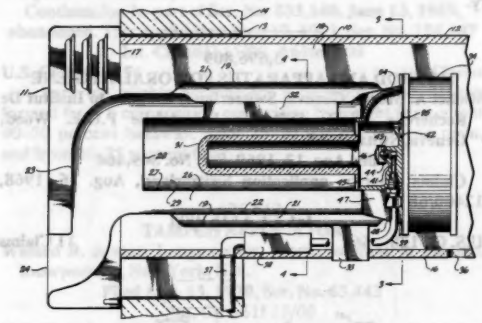
A log lighter includes support structure for transversely extending front and rear logs (which may function as log rests),

together with a transversely elongated gas burner carried by the support structure; flame chute structure extending generally frontwardly of the burner; and the burner having ports located in such combustible gas release relation to the chute structure as to produce full flame projection channeled for forward flow under the front log and to rise at the front of that log, as well as additional flame rising upwardly between the front and rear logs. Other flame chute structure may also produce flame projection below the rearlog to rise at the rear of that log, and a flame deflector may extend lengthwise over the burner and in predetermined relation to the chute structure.

3,696,802
GAS HEATER

Walter D. Teague, Jr., Nyack, N.Y., assignor to Southern California Gas Co., Los Angeles, Calif.

Filed Aug. 20, 1970, Ser. No. 65,374
Int. Cl. F24h *3/02*
U.S. Cl. 126—110 B **11 Claims**

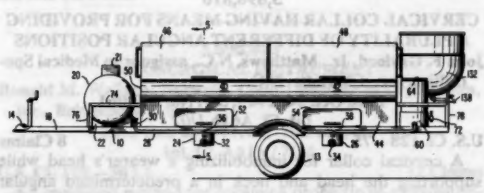


A gas fired space heater is described having a central combustion chamber containing a radiant burner. Combustion products pass upwardly from the combustion chamber to a concentric exhaust conduit within which they divide and pass through semi-cylindrical halves to a lower exhaust port to the exterior of the heater. Recirculation air from a space to be heated is drawn into the front of the heater through a fan at the back thereof. The recirculation air on the suction side of the fan passes through a recirculation conduit concentric with the exhaust conduit for preheating the air. On the pressure side of the fan the air passes through a heated air conduit concentric with and between the combustion chamber and the exhaust conduit for further heating before being discharged back into the space heated. An unusually short radiant burner is provided in the combustion chamber by arranging a concave deflector in front of a fuel gas orifice.

3,696,803
MOBILE KITCHEN

Alta Holloway, Jr., P.O. Box 488, Des Arc, Ark.

Filed July 7, 1971, Ser. No. 160,470
Int. Cl. F24b *3/00*; F24c *1/16*
U.S. Cl. 126—276 **11 Claims**

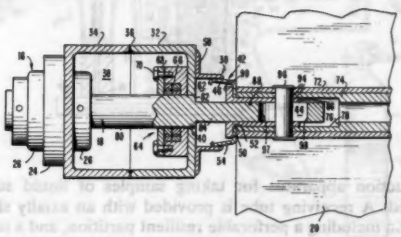


"Chuck Wagon" type apparatus including a pair of generally cylindrical barbecue type grills which may also be utilized as ovens is located on one side of a trailer. Deep fry apparatus is located on the other side and means located at the rear of the trailer is included for making and dispensing hot and cold beverages.

3,696,804
DAMPER WITH DOUBLE FLOATING SIDE RAILS

Candelario Paredes, Dallas, Tex., assignor to Forney Engineering Company, Dallas, Tex.

Filed Feb. 24, 1971, Ser. No. 118,261
Int. Cl. F23l *13/00*
U.S. Cl. 126—285 R **4 Claims**

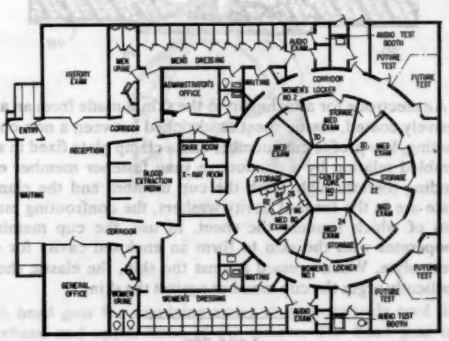


A damper unit is provided for regulating the flow of hot gases through a duct opening under high ambient temperature conditions. The damper blades are provided with a dual floating side rail arrangement to allow for lateral growth in opposite direction of the damper blades due to thermal expansion.

3,696,805
CARROUSEL MULTIPHASIC SCREENING LABORATORY

Orlin L. Sweeten, Mesa, and John C. Abromavage, Tempe, both of Ariz., assignors to Advanced Management Engineering & Research Co., Phoenix, Ariz.

Filed Jan. 21, 1971, Ser. No. 108,388
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 R **5 Claims**



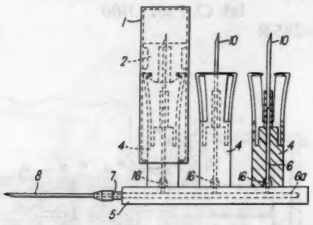
Medical examining laboratories, particularly an annulus defining a plurality of private medical examining rooms surrounding an inner core and a plurality of medical instruments mounted upon a carrousel rotating within said core, so as to deliver said instruments within said individual medical examining rooms.

3,696,806

APPARATUS FOR TAKING SAMPLES OF LIQUID

Andre Sausse, Sceaux, France, assignor to Rhone-Poulenc S. A., Paris, France

Filed Oct. 10, 1969, Ser. No. 865,399
Claims priority, application France, Oct. 10, 1968, 68169501
Int. Cl. A61b 5/14; A61m 1/00
U.S. Cl. 128—2 F 6 Claims



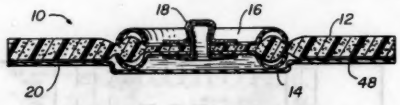
Suction apparatus for taking samples of liquid such as blood. A receiving tube is provided with an axially slidable piston including a perforable resilient partition, and a support rod, carrying a hollow needle connected to a suction tube, is insertable into the open end of the receiving tube, so that the needle when the support is inserted in the open end perforates the partition and places the space beyond the piston in communication with the suction tube. Interengagement of the support and piston prevents the piston moving relative to the support, when the support is moved relative to the receiving tube. More than one rod may be provided on a common suction duct.

3,696,807

MEDICAL ELECTRODE WITH RELATIVELY RIGID ELECTROLYTE CUP

Roman Szpur, Dayton, Ohio, assignor to MDM Corporation, Dayton, Ohio

Filed Feb. 13, 1970, Ser. No. 11,208
Int. Cl. A61b 5/04
U.S. Cl. 128—2.1 E 17 Claims



An electrode for attachment to the skin is made from an adhesively coated, elastic sheet sandwiched between a non-conducting, low profile cup member and a clamp plate fixed in assembled relation by a conductive snap fastener member extending therethrough. Both the cup member and the clamp plate are in the form of cavity washers, the confronting margins of which squeeze the sheet. In use, the cup member cooperates with the skin to form an enclosed cavity for an electrolyte. When pressed against the skin, the elastic sheet resiliently urges the cup member against the skin.

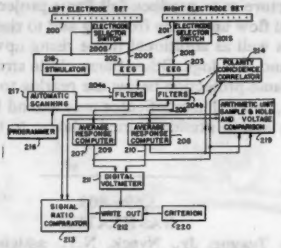
3,696,808

METHOD AND SYSTEM FOR BRAIN WAVE ANALYSIS

John E. Roy, 3135 Netherland Avenue, Riverdale, N.Y., and Robert Laupheimer, 68 Wilson Avenue, Westbury, N.Y.

Continuation-in-part of Ser. No. 748,330, July 29, 1968, abandoned. This application Aug. 19, 1970, Ser. No. 65,050
Int. Cl. A61b 5/04
U.S. Cl. 128—2.1 B 21 Claims

A plurality of pairs of electrical contacts are applied to the head, the pairs being applied simultaneously or in sequence. Each pair of contacts is in bilateral symmetry. The brain waves from each pair of contacts are amplified and compared to provide a correlation coefficient between the signals. Preferably



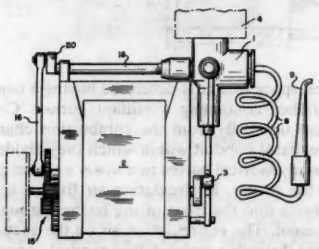
the correlation is obtained by an electric automatic polarity coincidence correlator. The correlation coefficient may be utilized as an aid in the diagnosis of certain types of brain injury.

3,696,809

METHOD AND APPARATUS FOR ORAL HYGIENE

Michel A. Moret, Geneva, Switzerland, assignor to Institut De Recherche Et De Diffusion Industrielle P.G.E. Wood, Geneva, Switzerland

Filed Aug. 12, 1969, Ser. No. 849,464
Claims priority, application Switzerland, Aug. 16, 1968, 12400/68
Int. Cl. A61h 9/00
U.S. Cl. 128—66 11 Claims



A method and apparatus for cleaning the teeth and massaging the gums are described in which a pulsating jet of liquid is pressure modulated, the modulation frequency being substantially lower than the frequency of the pulsations, and the modulated pulsating jet is directed against the surfaces to be treated. The pulsation frequency may be in the range of 600–6000 pulses per minute, and advantageously above about 3000, to clean the teeth effectively. The modulation frequency may be in the range of 70–600 cycles per minute, and advantageously less than about 300, to massage the gums effectively.

3,696,810

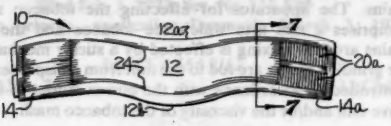
CERVICAL COLLAR HAVING MEANS FOR PROVIDING A PLURALITY OF DIFFERENT ANGULAR POSITIONS

John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Oct. 24, 1969, Ser. No. 869,061
Int. Cl. A61h 1/02
U.S. Cl. 128—75 8 Claims

A cervical collar for immobilizing a wearer's head while supporting the head and neck in a predetermined angular position such as the neutral position of the cervical vertebrae. The collar comprises a central core of a substantially stiff, porous, resilient foam material with a porous fabric outer

covering. A pair of Velcro fasteners are secured at the ends of the collar to retain the collar in a circular arrangement about the wearer's neck. The Velcro fasteners cover a substantial



area on the ends of the collar to permit the ends to be engaged in a variety of angular relationships whereby the angular position in which the wearer's head and neck are supported may be varied.

3,696,811

PERIODONTAL BANDAGE AND BACKING THEREFOR

James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 833,140, June 13, 1969, abandoned. This application June 17, 1971, Ser. No. 154,147

Int. Cl. A61l *15/00*; **A61m** *7/00*

U.S. Cl. 128—156 **8 Claims**

A hard but pliable backing for a periodontal bandage is formed from a composition comprising by weight from about 40–50 percent beeswax, from 25–30 percent terpene resin, and from 20–25 percent filler.

3,696,812

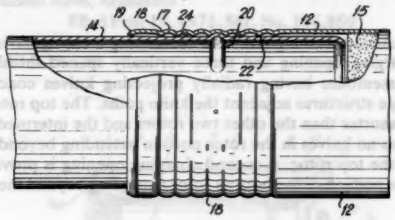
TAMPON APPLICATOR

Willard R. Jaycox, Longmeadow, Mass., assignor to Tampax Incorporated, New York, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,443

Int. Cl. A61f *15/00*

U.S. Cl. 128—263 **12 Claims**



A tampon applicator made with telescoping tubes, the outer tube having a series of rings convex in longitudinal section which meet, forming internal annular ridges, the inner diameter of which is slightly less than that of the undeformed portion of the same tube. The radius of the inner tube is substantially that of the annular ridges to give frictional engagement, and said inner tube has a nib of a height to snap into locking engagement with the concave valleys between said ridges. The rings in the outer tube form an enhanced finer-grip pattern in the rearward end.

3,696,813

CRYOSURGICAL INSTRUMENT

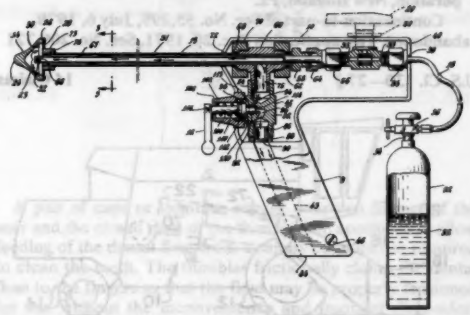
Ronald M. Wallach, Norwalk, Conn., assignor to Cryomedics, Inc., Bridgeport, Conn.

Filed Oct. 6, 1971, Ser. No. 189,469

Int. Cl. A61b *17/36*

U.S. Cl. 128—303.1 **12 Claims**

An improved method for cooling a probe tip of a cryosurgical instrument is provided by supplying a two phase refrigerant comprising a gaseous phase and a liquid phase to a restricted orifice adjacent an expansion chamber of the instrument, conveying the refrigerant through said orifice into said expansion chamber for expanding the gaseous phase into the chamber thereby providing a Joule-Thomson refrigeration effect and for providing additional cooling of the chamber by the evaporation of the liquid phase therein, and, conveying an effluent gas of the expansion chamber to atmosphere. A cryosurgical instrument comprises an expansion chamber formed of a high thermal conductivity material having an outer surface thereof which is adapted for contacting body tissue which



is to be treated, a means for conveying a gaseous refrigerant from a source thereof to said expansion chamber, said means including a stationary body forming an orifice of fixed dimensions through which said gas expands into said chamber for cooling said chamber, and, a means for exhausting said gas to atmosphere, said exhaust means including a flow channel communicating between said chamber and a quick acting flow valve, said valve biased for interrupting a flow path through the valve between said exhaust conduit and atmosphere and selectively operable to establish the flow path through the valve.

3,696,814

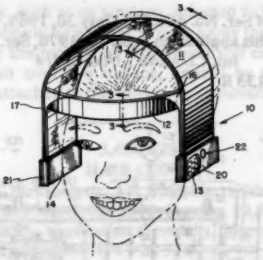
COOLING HEAD GEAR

Samuel Junji Umemoto, 1506 West Vernon Avenue, Los Angeles, Calif.

Filed June 14, 1971, Ser. No. 152,509

Int. Cl. A61n

U.S. Cl. 128—380 **4 Claims**



A head gear for supplying water to evaporatively cool the forehead and upper head of the wearer. The head gear includes a main band which extends over the top of the head from ear to ear and a forehead band which extends over the forehead and is stitched at each end to the main band at about the temple areas of the head. A pair of water-tight containers is secured at the ends of the main band near the ears. The bands are of absorbent material and the main band extends inside the containers and is immersed in water. An elastic band is joined to the main band to extend over the back of the wearer's head, firmly supporting the head gear in place. Water

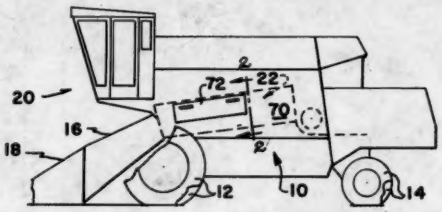
is supplied continually to the band upon the wearer's forehead and upper head by the hygroscopic action of the absorbent material and the evaporation of the moisture in those areas creates a cooling effect.

3,696,815

DETACHABLE SIDE PLATE FOR A THRESHING AND SEPARATING UNIT OF AN AXIAL FLOW COMBINE

Edward W. Rowland-Hill, Lancaster, and Edwin O. Margerum, Paradise, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 55,299, July 6, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 209,721
Int. Cl. A01f *12/26*
U.S. Cl. 130—27 J 14 Claims



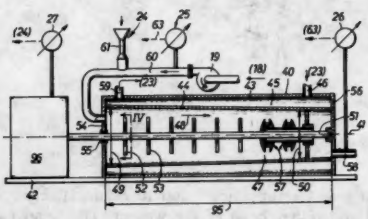
A longitudinally extending cylindrical casing of an axial flow threshing and separating unit of a combine has an outer side plate member extending circumferentially upwardly from the bottom concave portion of the casing. The side plate member is pivotally and detachably attached to the concave and is adapted to move with the concave as the concave is adjusted. The side plate is positioned along the concave to retain the removable rods of the concave. The detachment of the side plate provides ample access to the rotor disposed within the casing and to the concave. Different types of side plates may be mounted in the concave to vary the threshing and separating characteristics of the combine for different type s of crops.

3,696,816

A STIRRER-CRUSHER MILL FOR THE CONTINUOUS MANUFACTURE OF A TOBACCO MASH

Paul Buchmann, Basel, Switzerland, and Monique Beringer, St. Louis, France, assignors to Tamag Basel A.G., Basel, Switzerland

Division of Ser. No. 846,038, July 30, 1969, Pat. No. 3,605,757. This application Sept. 14, 1970, Ser. No. 72,155
Int. Cl. A24b *13/00, 03/14*
U.S. Cl. 131—133 R 11 Claims



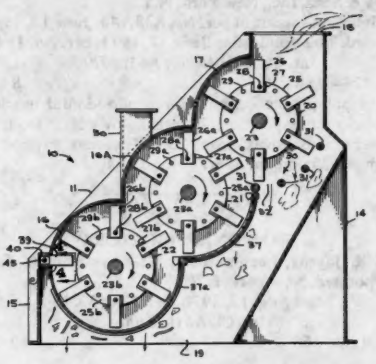
An apparatus is disclosed for the manufacture of reconstituted tabacco from a mash of reduced (pulverized) basic tobacco consituents. In the apparatus, the reduced tobacco is flotated using a liquid and the resultant slurry is forced through a glass grain body which is stirred at the same time. This homogenizes the slurry to form a mash. The glass grains are worn during the process. The detritus is discharged from the glass grain body along with glass grains which have been worn down to an unusable size, in the tobacco mash. New glass grains are used to replenish the glass grain body continuously and thus make good the loss to the glass grain body caused by wear and removal of the unusable glass grains. The apparatus for effecting the tobacco reduction comprises a mill into which the tobacco and the grinding grains are fed. Mixing is effected by a stirrer mechanism and the grinding grains are fed to the mill from a dispenser which is controlled in accordance with the power output of the stirrer drive unit and/or the viscosity of the tobacco mash.

3,696,817

TOBACCO THRESHING MACHINE

Charles W. Bonner, Jr., and Curtis T. Houck, both of Richmond, Va., assignors to The Cardwell Machine Company, Richmond, Va.

Filed June 4, 1971, Ser. No. 149,932
Int. Cl. A24b *05/10*
U.S. Cl. 131—145 9 Claims



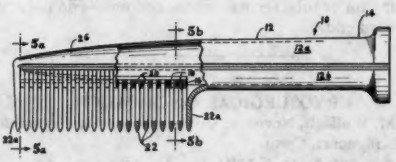
A tobacco threshing machine comprising a casing having a top charging opening and three vertically spaced threshing rotor assemblies having radially projecting knives coacting with cage structures adjacent the knife paths. The top rotor is axially shorter than the other two rotors and the intermediate rotor has no knives in the rotor portion extending beyond the end of the top rotor. A second charging opening is provided over the portion of the bottom rotor extending beyond the top rotor.

3,696,818

HAIR-DRYING COMB

Robert L. Weber, New Canaan, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed April 1, 1971, Ser. No. 130,112
Int. Cl. A45d *20/00*
U.S. Cl. 132—9 3 Claims



A hair-drying comb having open teeth is supplied with heated air which flows into the comb housing and through slots aligned with the openings in the teeth. Drying air is thereby directed laterally into the hair held between the teeth.

3,696,819

HEAT STORING HAIR ROLLER

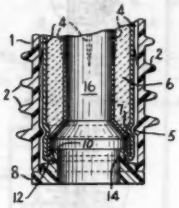
Erik Kjaer Jensen, Kalundborg, Denmark, assignor to Bristol-Myers Company, New York, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,539

Claims priority, application Denmark, March 3, 1970, 1053/70

Int. Cl. A45d *2/12*

U.S. Cl. 132—33 R 11 Claims



A heat storing hair roller is provided having an outer plastic casing and an inner heat storage body filled with a heat storage material. Means, such as a plurality of radially directed protrusions, are provided between the plastic casing and the inner body in order to impart a radial stress on the plastic casing. This radial stress compensates for the greater thermal expansion rate of the plastic casing as compared to the inner heat storage body and maintains good thermal contact between the casing and the storage body despite the difference in thermal expansion rate.

3,696,820

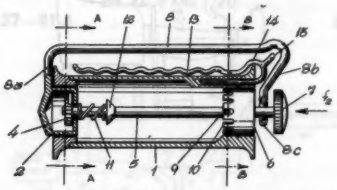
NEW HAIR-CURLING DEVICE

Eusebio Rodriquez Lara, avenida de Mayo 953, 4th floor, Buenos Aires, Argentina

Filed Feb. 19, 1971, Ser. No. 116,859

Int. Cl. A45d *12/00*

U.S. Cl. 132—40 2 Claims



A hair curling device, which consists of a tubular body with a cylinder hollow head mounted rotatably in one end of the body. A cap rotatably mounted in the opposite end of the tubular body. A central rod, which extends axially within the tubular body and has one end rotatably and slidably mounted within the hollow head and another end rotatably and slidably mounted within the cap. A sprocket wheel is mounted upon one end of the central rod and located within the hollow head. A pawl is carried by the hollow head and is adapted to engage the sprocket wheel. A substantially U-shaped rigid member having a central portion extending outside of the tubular body parallel to the central rod is also provided. A U-shaped elastic lamellar clip having a portion removably clamped to the tubular body and another portion extending elastically and longitudinally along an outer surface of the tubular body is also included to hold the hair in place. The parts are interconnected with one another in operative relationship to curl hair.

3,696,821

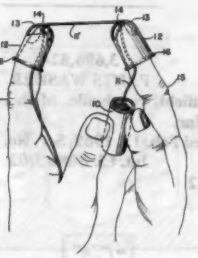
DEVICE FACILITATING USE OF DENTAL FLOSS

John Q. Adams, IV, 1206 Foxcroft Road, Richmond, Va.

Filed Oct. 14, 1971, Ser. No. 189,082

Int. Cl. A61c *15/00*

U.S. Cl. 132—91 8 Claims



A pair of caps or thimbles engage over two fingers of the user and the closed ends of the thimbles are apertured to allow feeding of the dental floss from a supply container as required to clean the teeth. The thimbles frictionally clamp the dental floss to the fingers so that the floss may be properly tensioned for use without the inconvenience and frequent discomfort which arises when the dental floss must be wound around the finger tips. The device is efficient and economical.

3,696,822

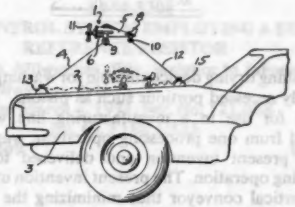
FLYING TOY

Nute Mace, 87 Allen Street, Sylva, N.C.

Filed Dec. 23, 1971, Ser. No. 211,353

Int. Cl. A63h *27/04*

U.S. Cl. 46—77 9 Claims



A flying toy, such as an airplane, adapted to be secured to a surface of a vehicle by a tether in such a way that the stream of air caused by the motion of the vehicle will cause the toy to soar in the air over the surface, limited by the tether, the tether being attached to the vehicle by removable means.

3,696,823

HAIR COMB

Heinz Dannat, Strittholzstr. 3 B, 8036 Herrsching, Germany

Filed March 16, 1970, Ser. No. 19,613

Claims priority, application Germany, March 12, 1969, G 69 09 802; July 18, 1969, G 69 28 514

Int. Cl. A45d *24/10*

U.S. Cl. 132—122 2 Claims

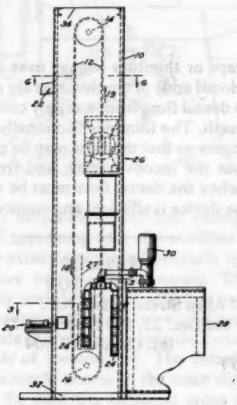
A generally comblike hand-operated instrument for parting of uniform, smooth sections of hair during hairdressing work,

especially in the styling of live hair on the head. The instrument has two spaced transversely projecting fingers which serve to separate a section of hair from the rest of the hair, and a longitudinally extending tail for manipulation of the separated section of hair.

3,696,824
PARTS WASHER

Homer G. Whitfield, Northville, Mich., assignor to Condeco Automation, Inc.

Filed Feb. 13, 1969, Ser. No. 798,927
Int. Cl. B08b *3/02*
U.S. Cl. 134—62 **5 Claims**



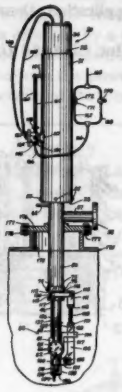
A washing drying device suitable for washing parts that have internally recessed portions such as pistons. The invention is suitable for use in a manufacturing line where parts are received from one processing operation, washed thoroughly by the present invention and delivered to a subsequent processing operation. The present invention utilizes a substantially vertical conveyor thus minimizing the necessary floor space and providing for the elevating of the parts between operations necessary in many manufacturing sequences. This is accomplished by providing the entrance near the lower portion of the washer and the exit near the upper portion of the washer.

3,696,825
TANK WASHER

John E. Guignon; Helen G. Guignon, both of 12 Clipper Road, St. Louis, Mo., and John E. Guignon, Jr., 5653 Sanger, Apt. 22, Alexandria, Va.

Filed May 19, 1969, Ser. No. 825,748
Int. Cl. B08b *9/08*
U.S. Cl. 134—167 R **18 Claims**

An automatically operable tank washer. A power head drives a screw through a fixed nut to rotate a nozzle assembly while moving the nozzle assembly lineally. A linkage causes the nozzle on the nozzle assembly to swivel during lineal movement of the nozzle assembly. The power head includes a piston-operated reversible rotary motor that is controlled by the supply of air to a four-way automatic reversing valve with spring-loaded mechanical switches. An automatic throttle valve to vary the speed of the motor in response to the lineal position of the screw. An automatically operable cam valve to vary the speed of the motor during each 360° cycle of rotation of the screw. Means for interchanging screws to vary the pitch

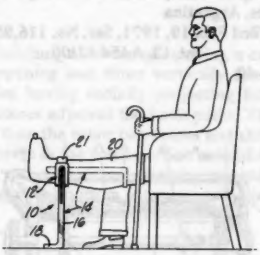


of the screw. Means for interchanging cams to select the patterm of rotational speed variation.

3,696,826
LEG SUPPORTING DEVICE

James A. Gruzalski, 10509 Winnetka Avenue, Los Angeles County, Calif.

Filed July 17, 1970, Ser. No. 55,717
Int. Cl. A61f *5/02*; A45b *1/00*
U.S. Cl. 135—45 **8 Claims**



A device for supporting an individual's leg in a substantially horizontal position when the individual is seated. The device is particularly designed to support a leg in a cast, and is adapted to be worn on the cast around the user's leg when the device is not in use. The device includes a generally U-shaped ankle engaging member adapted to be secured around the user's ankle or lower calf, and a stanchion rotatably connected to the ankle engaging member. The stanchion includes a pair of parallel support bars, each of which mounts the ankle engaging member at one end thereof. The other end of each support bar is integrally connected to another generally U-shaped member which acts as a base for the stanchion when the device is in use, and which partially encircles the upper calf portion of the user's leg when the device is not in use.

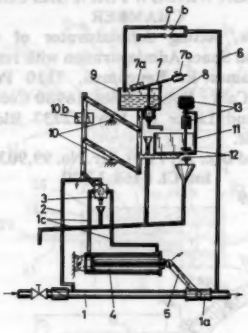
Suitable stop means are provided on the ankle engaging member and the upper ends of the stanchion for limiting rotational movement of the stanchion relative to the ankle engaging member. The support bars are preferably slotted to permit the stanchion to be adjusted to a comfortable position on the user's leg when the device is not in use.

3,696,827

DEVICE FOR AUTOMATIC PLANT WATERING

Heinrich Sterlich, Osterrich 2801, Katzelsdorf, Austria

Filed Dec. 8, 1969, Ser. No. 870,287
Int. Cl. A01g 27/00
U.S. Cl. 137—79 4 Claims



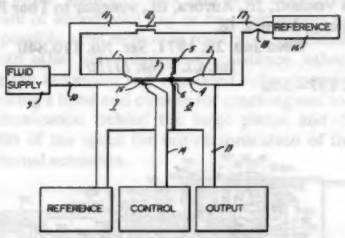
A device for automatic plant watering has a fluid control valve. The valve is actuated by a pump which is controlled by a multi-way cock. The multi-way cock is connected to a scale carrying two vessels on a scale beam. Water is drained from the first vessel when a second scale connected to this vessel is not subjected to the pressure of water flowing into the vessel. Water from the first vessel flows to the second vessel from which it is drained by a heat-sensitive device.

3,696,828

COMMON SUPPLY FOR OPPOSING JET FLUIDIC DEVICE

Bjorn G. Bjornsen, Milwaukee, and Louis D. Atkinson, New Berlin, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 10, 1970, Ser. No. 62,585
Int. Cl. F15c 1/20
U.S. Cl. 137—81.5 11 Claims



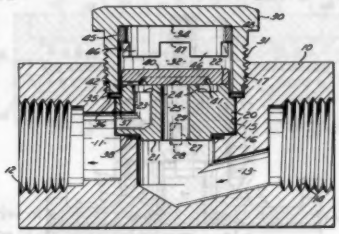
An impact modulator includes a pair of opposed nozzles having corresponding orifices establishing opposed impacting streams. An intermediate wall includes a control orifice aligned with the nozzles and located adjacent the impact position. The nozzles are connected to a fluid source with one nozzle connected through a pressure-dropping restrictor. A bleed conduit is connected to the downstream side of the restrictor and includes a bleed restrictor having an orifice which is preferably of a cross section equal to or greater than that of the nozzle orifice.

3,696,829

AUTOMATIC STEAM TRAP

Allan R. Goellner, Parma Heights, Ohio, assignor to The Clark-Reliance Corp., Cleveland, Ohio

Filed Dec. 30, 1970, Ser. No. 102,645
Int. Cl. F16t 1/00
U.S. Cl. 137—183 3 Claims



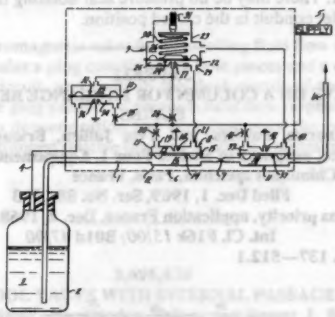
An automatic steam trap that utilizes a floating disc located in a sealed control chamber to open and close inlet and outlet ports in the floor of the control chamber for steam and for air and/or condensate respectively. The disc moves in response to the pressure condition in the chamber between a closed position sealing off the ports and an open position spaced away from the ports. The movement of the disc to its open position is limited by a tubular spacer in the control chamber with spaced projections engageable with the outer margin of the top surface of the disc. The spaces between the projections permit fluid to pass from the lower portion of the control chamber below the disc to the upper portion of the control chamber above the disc so that fluid pressure can act against the top surface of the disc.

3,696,830

FLOW CONTROL SYSTEM EMPLOYING A SERIES REFERENCE RESISTOR

George J. Janu, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed March 4, 1971, Ser. No. 121,038
Int. Cl. F16k 3/385
U.S. Cl. 137—209 11 Claims

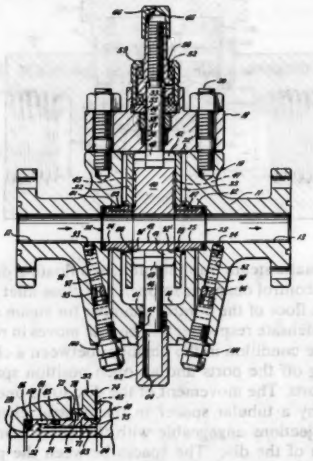


A reference resistor is connected in a flow line connected to a pressurized bottle. A pair of diaphragm repeaters are connected one to each side of the resistor. Each repeater includes a flow chamber in series with the line and having a diaphragm common to an output chamber having a bleed orifice, responsive to the position of the diaphragm. A diaphragm controller has opposite sides of a diaphragm subjected to the outputs of the fluid repeaters and controls a nozzle connected to an air supply and a repeater the output of which connects the air supply to the bottle.

3,696,831
VALVE

John H. Fowler, Glenshaw, Pa., and Robert D. Barnett, Houston, Tex.

Continuation of Ser. No. 21,101, March 19, 1970, abandoned.
This application Nov. 11, 1971, Ser. No. 198,001
Int. Cl. F16k 3/26
U.S. Cl. 137—246.12 20 Claims

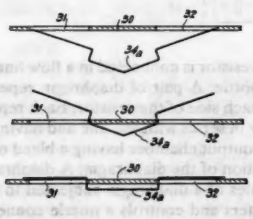


A gate valve comprising a valve body having inlet and outlet conduits with a chamber therebetween and a plane surfaced seat member in the inlet conduit. A plane surfaced gate having an opening therethrough is disposed in the chamber with reciprocating apparatus for moving the gate from a closed position in which flow is blocked through said conduits and an open position in which flow is allowed through said conduits and said gate opening. A resilient member may be installed adjacent the seat member urging the seat member and gate toward and in sealing contact with each other when the gate is in closed position so that the chamber is isolated from the inlet conduit. A plane surfaced skirt member may be mounted in the chamber adjacent to the gate member and with an opening therethrough aligned with the outlet conduit. The skirt member provides a sliding surface for one side of the gate member. There may be no pressure seal isolating the chamber and outlet conduit in the closed position.

3,696,832
VALVE ON A COLUMN FOR EXCHANGE BETWEEN FLUIDS

Guy Maurice, Poitiers, and Yves Jullien, Brioude, both of France, assignors to Societe Pour L'Equipement des Industries Chimiques speichim, Paris, France

Filed Dec. 1, 1969, Ser. No. 881,313
Claims priority, application France, Dec. 2, 1968, 68176217
Int. Cl. F16k 15/00; B01d 47/00
U.S. Cl. 137—512.1 11 Claims

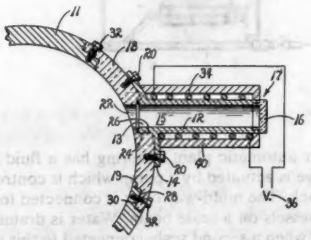


The specification discloses a pair of valve caps for a phase contacting column in which the valve caps of the pair are linked together underneath the separator plate. The caps may be formed as a single composite unit, as a pair of complete caps for connecting one to another, or as a collection of at least three components which may be assembled to form a composite unit of two caps.

3,696,833
OBSERVATION WINDOW FOR A GAS CONFINING CHAMBER

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; James R. Baughman, 7110 Pomelo Drive, Canoga Park, Calif.; Robert Spies, 16980 Cotter Place, Encino, Calif., and Lance G. Hays, 2737 Ridge Pine, La Crescenta, Calif.

Filed Dec. 21, 1970, Ser. No. 99,903
Int. Cl. F16k 37/00
U.S. Cl. 137—559 2 Claims

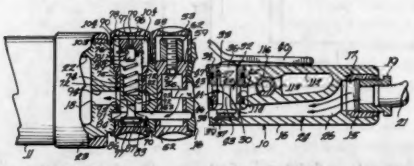


An observation window particularly suited for use in visually observing an internal portion of a casing adapted to confine therewithin a fluid medium. The window is characterized by a body having an internal chamber disposed in direct communication with the internal portions of the casing, a transparent closure of a substantially planar configuration, and a heater coil within which the body is confined, whereby gas delivered from the casing to the chamber is heated by the coil for thus establishing within the chamber a cell of unsaturated gas isolating the transparent closure from the fluid medium.

3,696,834
FLUID CONTROL DEVICE

William Vonhoff, Jr., Aurora, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Jan. 29, 1971, Ser. No. 110,840
Int. Cl. F16k 11/10
U.S. Cl. 137—596 11 Claims



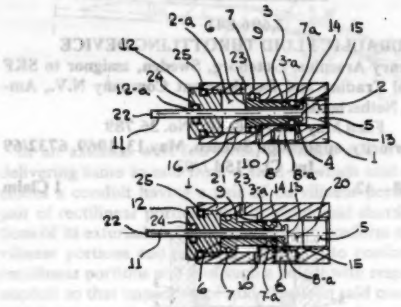
A fluid control device for controlling a flow of motive fluid to an associated fluid driven mechanism is disclosed, wherein a fluid pressure actuated shut-off valve is provided for automatically shutting off the flow of motive fluid to the associated mechanism whenever the pressure in the fluid passage of the device reaches a predetermined value. A novel adjusting structure is provided for varying the response pressure of the shut-off valve.

3,696,835

CONTROL VALVE

Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio

Filed Jan. 25, 1971, Ser. No. 109,242
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.6 10 Claims



A fluid power control valve for use with pneumatic or hydraulic pressurized working fluids or a combination thereof comprising a three way valve including a spool with symetrically opposing pistons of differential area at spool extremities of which a small piston of the spool end faces the fluid entrance port whereas the opposite spool end with large diameter piston is blocked from fluid contact by a seal of a centrally situated control rod which passes the spool and protrudes to the outside through the valve end closure for actuation to facilitate shifting of the spool from a valve open first position for cylinder pressurization by the working fluid which moves the spool and the rod assembly sealed toward the end closure constituting a stop, to a second closed position upon actuation of the control rod in terms of a slight motion accompanied by seal cracking and supply of the fluid via clearance hole of the rod to enter behind the large piston of the spool for immediate spool return to the original first position, simultaneously exhausting cylinder and relieving fluid pressure from behind the large piston upon the completion of the cycle, so constructed that the shift of the spool for cylinder actuation can be accomplished externally with very little force to physically move the control rod either manually, by a cam of an electric timer, by pilot pressure of added pilot cap or by other means involving as little as possible axial motion in rod travel, conditions unattainable with other valve designs in existance, other means comprising the automatic self-regulated valve operation with rod end striking a blind end closure for cracking seal to initiate fluid communication behind the large piston and the subsequent shift of the spool for self-reciprocation of the valve without external actuation.

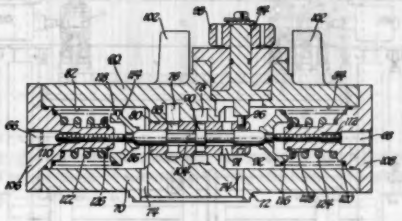
3,696,836

POWER TRANSMISSION

Leo Bauer, Troy, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Jan. 6, 1971, Ser. No. 104,377
Int. Cl. F16k *31/48*
U.S. Cl. 137—625.25 5 Claims

A variable speed reversible hydraulic transmission has a control valve which permits any desired value of pressure to be applied to the hydraulic motor in either direction at will. The valve controls a servomotor in the transmission and has two concentric spools slidable in the body and in each other. One spool is pressure responsive in either direction from a central position determined by opposed springs. The other spool is selectively shiftable to move the neutral position of the valve any desired distance to either side of the central position. The device is suitable for controlling the horizontal



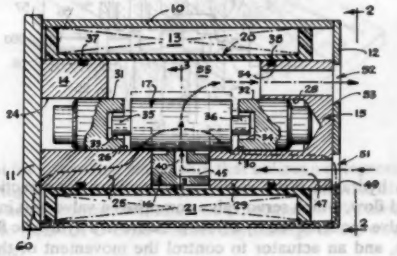
swing drive of a power shovel or crane to apply any desired accelerating or decelerating torques.

3,696,837

ELECTROMAGNETIC FLUID CONTROL VALVE

Raymond G. Reip, Clarendon Hills, Ill., assignor to GPE Controls, Inc., Morton Grove, Ill.

Filed May 7, 1971, Ser. No. 141,137
Int. Cl. F16k *31/06*
U.S. Cl. 137—625.33 15 Claims



An electromagnetic valve for controlling fluid flow in a line which includes a plug coacting with pole pieces and a coil in a magnetic circuit, and ports in the fluid circuit of the valve, wherein the plug permits or prevents fluid flow respectively in response to deenergization and energization of the coil. The ports are arranged relative the plug to effect a partial pressure balancing.

3,696,838

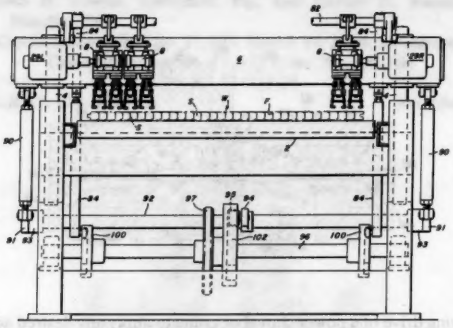
SPOOL VALVE WITH INTERNAL PASSAGE

John E. Ullman, Huntingdon Valley, and Ernest J. Rollings, Jr., Jenkintown, both of Pa., assignors to United States Steel Corporation

Division of Ser. No. 697,866, Jan. 15, 1968, Pat. No. 3,539,420. This application May 15, 1970, Ser. No. 37,605
Int. Cl. F16k *23/00, 3/26*
U.S. Cl. 137—625.38 5 Claims

A spool type valve especially adapted for controlling flow of an adhesive has two spaced apart enlargements in an axial opening with an entry connection to the first enlargement and an exit connection to the second enlargement. The slidable spool has an axial opening which has closed ends and a length

greater than the distance between the enlargements. The closed axial opening has two sets of radial openings which are



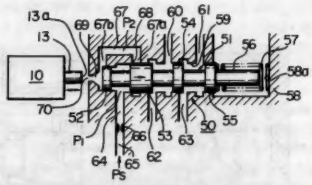
spaced apart the same distance as the enlargements. A bearing portion on the spool is movable into the second enlargement.

3,696,839

HYDRAULIC SERVO VALVE

Namio Irie, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sept. 3, 1970, Ser. No. 69,393
Claims priority, application Japan, Sept. 5, 1969, 44/69959
Int. Cl. F16b *5/00*; F16k *11/07*
U.S. Cl. 137—625.61 3 Claims



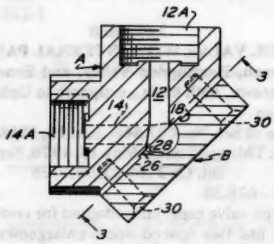
A hydraulic servo valve for controlling the direction of a fluid flow, which servo valve comprises a valve unit including a valve spool moved by a fluid pressure in a hydraulic fluid circuit, and an actuator to control the movement of the valve spool in accordance with electric signals that it receives, said valve unit having a pressure regulating portion for reducing the amount of leaks of an operating fluid.

3,696,840

ADAPTOR FOR ANGULARLY DIVERTING VISCO-ELASTIC MELT FLOW

Oliver Randolph Odhner, Westgrove, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 22, 1970, Ser. No. 100,638
Int. Cl. F15d *1/04*
U.S. Cl. 138—39 9 Claims



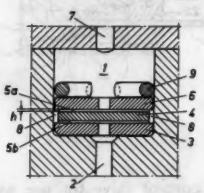
An adaptor for diverting the flow direction of a visco-elastic melt stream employs a deflector cover plate which is detachably secured to a block-like body having angularly arranged channels emerging through an inclined surface. The cover plate includes a centrally disposed outwardly projecting shoulder which is received in a complementary recess formed about an imaginary geometric figure circumscribing the emergent channels. An arcuately cupped surface formed in the shoulder has a lip congruent with the imaginary geometric figure.

3,696,841

HYDRAULIC FLUID THROTTLING DEVICE

Torsten Henry Arsenius, Goteborg, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed May 13, 1970, Ser. No. 36,789
Claims priority, application Sweden, May 13, 1969, 6732/69
Int. Cl. F15d *1/02*
U.S. Cl. 138—42 1 Claim



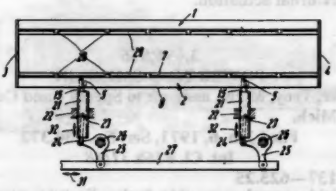
A throttling device included in a hydraulic system, for instance of the kind supplying operating fluid to a hydrostatic bearing, includes plane, superimposed washers arranged in pairs and fitted into a recess having a plane bottom and arranged in the machinery component to be supplied with fluid, in such a manner that the fluid will flow in a generally axial direction through the recess. One first washer of the pair has a shallow groove in each side surface, and when this washer is placed between the plane bottom of the recess and the second washer of the pair, which has unserrated side surfaces but a central passage, the grooves will form the desired restriction to flow. By altering the cross section of the grooves, and/or by varying the number of pairs of washers any desired resistance to flow may be obtained.

3,696,842

DEVICE FOR COUPLING A WEAVING SHAFT WITH A RECIPROCATING DRIVE LIFTER

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Feb. 12, 1969, Ser. No. 798,655
Claims priority, application Switzerland, March 28, 1968, 4619/68
Int. Cl. D03c *13/00*, *9/06*
U.S. Cl. 139—57 10 Claims



The coupling device utilizes a toothed block on the heddle frame to engage a complementary toothed hook of a holder on the drive lifter in order to distribute the lifting and reciprocating forces between the cooperating surfaces. The block has two or more teeth with or without inclined sidewalls which mate within corresponding gaps of the holder.

3,696,843

EXTERNAL WEFT FED LOOM AND A SHUTTLE THEREFOR

Albert E. Moessinger, 1 Grand Place, Fribourg, Switzerland

Filed Jan. 12, 1970, Ser. No. 2,174
Int. Cl. D03d 47/24; D03j 5/06
U.S. Cl. 139—125 11 Claims

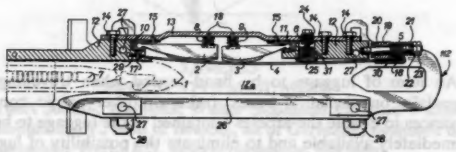
In an external weft fed loom, a shuttle and a circuit for delivering same to and from a shed in which said circuit includes a conduit having a pair of curvilinear portions and a pair of rectilinear portions and in which said shuttle has portions of its external surfaces contoured to conform to said curvilinear portions and portions contoured to conform to said rectilinear portions and is of such a height with respect to said conduit so that impacting of said shuttle in said conduit when said shuttle traverses said conduit is eliminated.

3,696,844

BRAKING SHUTTLE BOX

Adolf Oswald Bernatschek, Hochkreuzweg 2, CH-9320 Arbon/TG, Switzerland

Filed Nov. 4, 1969, Ser. No. 873,995
Claims priority, application Switzerland, Nov. 5, 1968, 16483/68
Int. Cl. D03d 49/54
U.S. Cl. 139—186 9 Claims



A braking shuttle box has a fixed brake wall and a leaf spring opposite the brake wall forming with the same a brake channel for a shuttle. First energy absorbing means having high mass and inertia and second energy absorbing means having low mass and inertia are provided on the outer side of the leaf spring and urge the same toward and into the brake channel so that a shuttle entering the brake channel and engaging the leaf spring transfers energy to the mass of the first energy absorbing means while the leaf spring is biassed into sliding engagement with the shuttle by the second energy absorbing means so that the shuttle is braked in the brake channel.

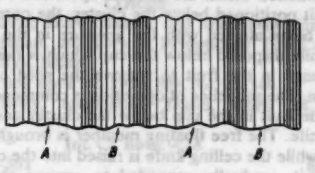
3,696,845

CURTAIN

Josef Acker, Seligenstadt; Albert Hofmann, Bischofsgruen, and Georg Fruhholz, Bischofsgruen-Wuelfersreuth, all of Germany, assignors to Jacob Acker & Sohne oHG, Seligenstadt, Germany

Filed Nov. 12, 1969, Ser. No. 875,820
Claims priority, application Germany, Jan. 28, 1969, G 69 03 060.0
Int. Cl. D03d 23/00, 25/00
U.S. Cl. 139—383 8 Claims

A curtain made of a transparent curtain material has wavy or undulating selvage at its bottom edge and lengthwise panels. The weft threads of the fabric extend lengthwise and the density of these threads is increased in alternate panels from the lengthwise midline of the panels toward the edges of the adjacent panels and the crosswise warp threads are alternately convexly and concavely curved from panel to panel



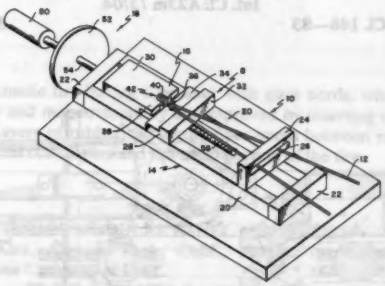
whereby the curtain while actually flat presents when hung the optical appearance of a curtain having the folds of a pleated curtain.

3,696,846

TOOL FOR U-BENDING OF PLATED WIRE

Fortunato N. Rotondo, Concord; Emil Toledo, Natick, and Leslie Lawrence, Needham, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 15, 1971, Ser. No. 153,308
Int. Cl. B21f 1/00
U.S. Cl. 140—102 10 Claims



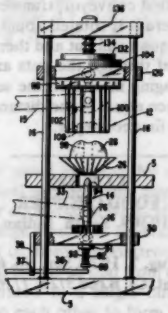
A tool for U-bending plated wire that utilizes a compression type spring to bend the wire around a pin. The resilience of the spring when in contact with the wire contours the wire around the pin to form the U-bend without any damage to the wire or its coating.

3,696,847

APPLE SLICER AND CELLER

Arthur B. Erekson, Scarsdale, N.Y., and Malcolm S. Lane, Baltimore, Md., assignors to Borden Inc., New York, N.Y.

Filed June 15, 1970, Ser. No. 46,222
Int. Cl. A23n 3/08
U.S. Cl. 146—42 14 Claims



The apparatus includes a cluster of knife blades which is moved up and down to slice the fruit; a free floating cylinder

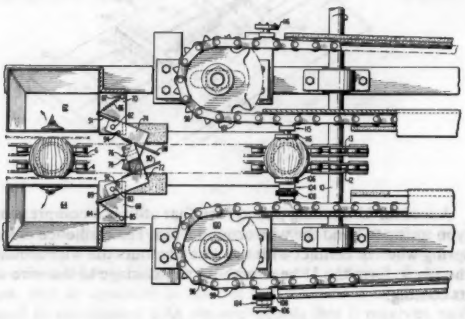
having axial slots and freely resting on the cluster, the cluster being disposed within the free floating member with its blades being positioned within the slots; an apertured cup holding a cored fruit positioned below the cluster, the core passage of the fruit being aligned with the aperture in the cup; and a celling knife disposed below the cup which is raised into the core passage in the fruit to remove the seed cell material thereupon. The sequence of operation is commenced by positioning the fruit in the cup below the cluster and above the celling knife. The free floating member is brought to rest on the fruit while the celling knife is raised into the core passage in the fruit, gradually expanded to remove the seed cell material therefrom in small particles, collapsed and retracted from the core passage. The cluster of knife blades is advanced against the fruit to slice same and retracted while the free floating member, being restrained by the flexible stop member, extracts wedged slices of the fruit from between the knife blades.

3,696,848

METHOD AND APPARATUS FOR REMOVING SKIN FROM ONIONS OR LIKE VEGETABLES

Eugene P. Mellon, Alexandria, Va., and Lester A. Kisner, Clarksburg, Md., assignors to Marriott Corporation, Montgomery County, Md.

Filed July 22, 1970, Ser. No. 57,224
Int. Cl. A23m *15/04*
U.S. Cl. 146—83 **5 Claims**



An onion skin is cut into two truncated hemispherical segments and a stream of fluid is directed under the skin to remove it from the onion.

The onion is prepared for the skin-removal operation by cutting off its crown and root ends and making longitudinal cuts in the skin on a first conveyor, transferring the onion to a second conveyor where it is rotated about its polar axis while first being given an equatorial cut and then being subjected to fluid streams directed through the cuts and under the onion skin. The onion-engaging means on the second conveyor are spaced apart a distance equal to the distance between the end cutting blades on the first conveyor.

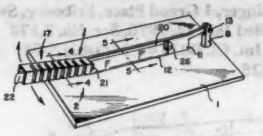
3,696,849

FOOD CHOPPER

William E. Davis, 10309 South Indian River Drive, Fort Pierce, Fla.

Filed Aug. 7, 1970, Ser. No. 62,038
Int. Cl. B26d *3/26, 1/26*
U.S. Cl. 146—146 R **9 Claims**

A chopper for vegetables and like materials includes a board or base to which one end of a cutting blade assembly is universally pivoted. The assembly includes a main straight cutting blade and a dicer blade which is pivoted to the straight blade for selective pivoting either to a position of use in



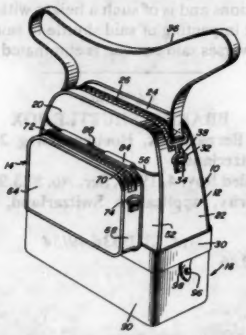
cooperation with the main blade, or to inactive position within the handle part of the main blade.

3,696,850

MULTIPLE UNIT HAND LUGGAGE

Julia R. Rosenblum, 6 West 77th Street, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,827
Int. Cl. A45c *13/26*
U.S. Cl. 150—33 **10 Claims**



An item of luggage to be hand-carried when travelling, especially on airplanes, buses, trains or other public conveyances to enable the articles contained in the luggage to be immediately available and to eliminate the possibility of luggage becoming lost in transit. The luggage includes a larger bag having an access opening therein and a carrying strap detachably connected thereto, a smaller bag detachably mounted on one side of the larger bag for support therefrom when assembled therewith and a detachable tray-like container of substantially rigid construction mounted on and forming a continuation of the bottom of the larger bag. The detachable carrying strap for the larger bag is removed therefrom and attached to the smaller bag when it is desirable to carry only the smaller bag.

3,696,851

CHEMICAL COMPOUNDS AND COMPOSITIONS

Donald R. Randell, Stockport, England, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 753,321, April 26, 1968, Pat. No. 3,536,706, which is a division of Ser. No. 526,401, Feb. 10, 1966, Pat. No. 3,414,618, which is a division of Ser. No. 431,709, Feb. 10, 1965, abandoned. This application Jan. 27, 1970, Ser. No. 6,309
Claims priority, application Great Britain, Feb. 11, 1964, 5,593/64; Feb. 29, 1964, 8,579/64
Int. Cl. C10m *1/34*
U.S. Cl. 252—51.5 A **7 Claims**

Chemical compositions are composed of synthetic lubricant and antioxidant compound of the formula:

A–NH–B

wherein A and B are the same or different and each is an aryl

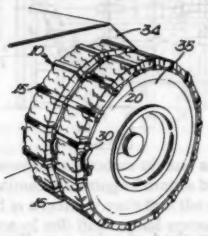
group, and one of the aryl group A and B contains a tertiary alkyl substituent group having from four to 12 carbon atoms.

3,696,852

FLEXING TIRE TRACTION DEVICE

Loren C. Oulman, 946 Twenty-third Avenue N.E., Minneapolis, Minn.

Filed Aug. 3, 1970, Ser. No. 60,395
Int. Cl. B60c 27/04
U.S. Cl. 152—220 4 Claims



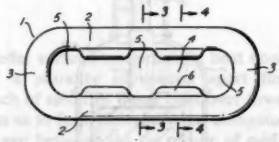
A plurality of traction devices that are rigid fit the profile of a flexing tire and so are gripped by it as it flexes; the units are held in close proximity to the tire by a wire rope structure that takes full advantage of the strength of wire rope.

3,696,853

PROTECTIVE MAIL MESH

Herbert Sobota, Warstein; Walter Siepmann, Sr., and Walter Siepmann, Jr., both of Belecke, all of Germany, assignors to Siepmann-Werke KG, Belecke/Moehnne, Germany

Filed Dec. 19, 1969, Ser. No. 886,684
Claims priority, application Germany, Dec. 27, 1968, P 18 17 170.5
Int. Cl. B60c 27/06
U.S. Cl. 152—231 14 Claims



A protective mail mesh for vehicle tires comprises a tread strip for surrounding the tread face of a vehicle tire and two side strips for respectively overlying the side faces of the vehicle tire. The strips are each composed of a plurality of elements each of which comprises at least two discrete sections which are configurated so as to admit of releasable connection solely as a function of their respective configuration and which are releasably connected with one another with each section being connected with and secured against undesired release from the respective strip by at least one adjacent section.

3,696,854

BIAS PLY TIRE HAVING A BREAKER WITH GLASS CORDS

Tetsuo Watanabe; Akira Oikawa, and Masayoshi Kuroda, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed April 14, 1970, Ser. No. 28,340
Claims priority, application Japan, April 24, 1969, 44/31258
Int. Cl. B60c 9/18
U.S. Cl. 152—361 6 Claims

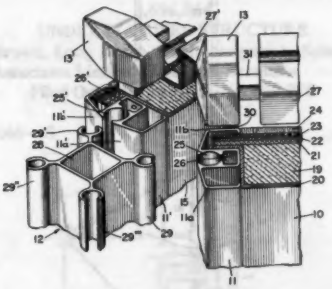
A pneumatic tire having a breaker with glass cords, whose durability and maneuverability are improved by inserting one or more layers of rubberized textile fiber cords between rubberized glass cord layers and the tread portion of the tire.

3,696,855

INTERIOR MODULAR PANEL ASSEMBLIES

Hiroshi Kira, Canoga Park, Calif., assignor to General Telephone Company of Calif.

Filed Oct. 16, 1970, Ser. No. 81,201
Int. Cl. A47g 5/00
U.S. Cl. 160—135 3 Claims



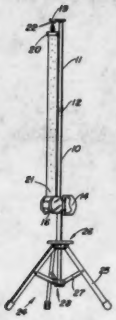
An interior modular panel assembly for office landscaping includes several identical panels having edge railings defining cylindrical recesses for cooperation with cylindrical inserts integrally formed on a hinge structure. Several such hinge structures are provided, all of identical construction and each including four cylindrical inserts so that from one to four panels may be pivotally mounted to a single hinge structure and pivoted with respect to each other to form a desired angular configuration. The assembly is completed by corner and leg pieces cooperating with the end portions of the edge railings to finish off the overall appearance of the assembly.

3,696,856

SWIVEL STANDARD FOR PORTABLE PROJECTION SCREEN

Fred S. Potter, Warsaw, Ind., assignor to Da-Lite Screen Company, Inc., Warsaw, Ind.

Filed Dec. 21, 1970, Ser. No. 100,128
Int. Cl. G03b 21/56
U.S. Cl. 160—24 3 Claims



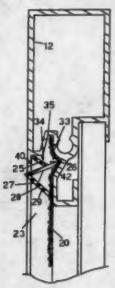
A standard for a portable projection screen providing for improved image focus and picture clarity over the whole of the screen by easy and convenient swivel adjustment of the screen about the stand axis without lifting the standard base off the floor.

3,696,857

PANEL AND FRAME ASSEMBLY

Frank M. Le Tarte, 9094 Yager Road, Smith Creek, Mich.

Continuation-in-part of Ser. No. 799,579, Feb. 17, 1969. This application Jan. 21, 1971, Ser. No. 108,456
Int. Cl. E06b 9/24
U.S. Cl. 160—371 3 Claims



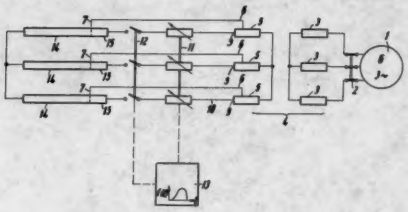
A panel and frame assembly and method for producing same in which the frame is provided with a longitudinally extending channel facing the area to be panelled. The panel is secured by a strip extending longitudinally of the frame and engaging the channel in snap-fitting relationship. In securing solid panels in the frame, the strip is secured in the channel by a cam-locking relationship between the strip and the frame. The strip has three distinct spring actions in which two portions of the strip act as separate compression springs, while another portion acts as a tension spring. In securing fabric panels into the frame, the spring and cam actions are the same as in securing solid panels. Additionally, the portion of the strip which acts as the cam-lock engages the fabric.

3,696,858

METHOD FOR CASTING METERED QUANTITIES OF LIQUID METALS

Gerhard Seulen, Remscheid, and Axel Von Starck, Remscheid-Luttringhausen, both of Germany, assignors to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed May 2, 1969, Ser. No. 821,342
Claims priority, application Germany, Sept. 24, 1968, P 17 83 044.3
Int. Cl. B22d 37/00
U.S. Cl. 164—49 7 Claims



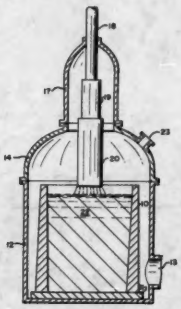
An improved method of using travelling field runners in which liquid metal is conveyed therein by travelling magnetic fields to moulds, die casting machines, casting belts and the like by controlling the flow of liquid metal therein from an initially relatively low rate up to a maximum and thereafter continuously reducing the rate from the maximum until a predetermined amount of metal has been poured.

3,696,859

PRODUCTION OF LARGE STEEL INGOTS WITH CONSUMABLE VACUUM ARC HOT TOPS

Lloyd R. Cooper, Pittsburgh, Pa., assignor to Heppenstall Company

Continuation-in-part of Ser. No. 80,669, Oct. 14, 1970, abandoned. This application May 18, 1971, Ser. No. 144,440
Int. Cl. B22d 27/02
U.S. Cl. 164—52 7 Claims



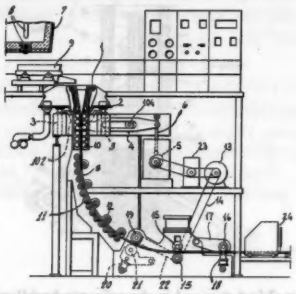
A method is provided for preventing shrinkage cavities and voids in steel ingots by the steps of forming a body of degassed molten steel in an ingot mold and continuously supplying molten steel by vacuum arc remelting an electrode into the body of molten steel at a controlled rate substantially equal to the volume loss by shrinkage on cooling until the body of steel is solidified.

3,696,860

METHOD AND APPARATUS FOR THE CONTINUOUS CASTING OF FLAT BLOOMS OR THE LIKE

Piero Colombo, 27, via Leopordi, Udine, Italy

Filed June 20, 1971, Ser. No. 149,337
Int. Cl. B22d *11/00*
U.S. Cl. 164—73 7 Claims



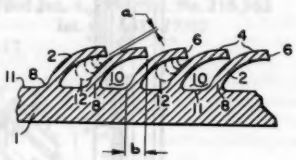
The invention provides a process of, and a continuous casting mould for, continuous casting of metals by pouring molten metal into a mould in a manner such that the metal issues from the mould as a core of still fluid metal encased in a solidified outer sleeve. The sleeve is formed in the mould by the casting of two sections of U-shaped cross-section with the lateral limbs of the U facing and opposed to each other and the facing limbs are engaged with and welded one to the other as they pass through the mould.

3,696,861

HEAT TRANSFER SURFACE HAVING A HIGH BOILING HEAT TRANSFER COEFFICIENT

Ralph L. Webb, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Continuation of Ser. No. 657,155, July 31, 1967, abandoned.
This application May 18, 1970, Ser. No. 37,476
Int. Cl. F28f *13/00*
U.S. Cl. 165—133 15 Claims



A heat transfer surface comprising a heat conductive base member and a plurality of spaced apart fins extending therefrom, each of said fins being bent over towards the next adjacent fin so as to form therebetween elongated, re-entrant cavities. The gap between the tip of one of said fins and the next adjacent fin is sufficiently small to promote and sustain nucleate boiling of a fluid in contact with said fins and said base member.

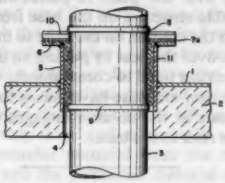
3,696,862

INDUSTRIAL FURNACE

Jan Van Dijk, The Hague, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 26, 1971, Ser. No. 119,243
Claims priority, application Netherlands, March 5, 1970, 70033126
Int. Cl. F28f *9/06*
U.S. Cl. 165—178 4 Claims

Improved heating tube support means for industrial furnaces having heating tubes extending through the furnace wall.

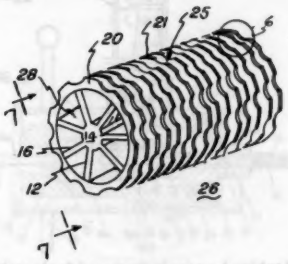


3,696,863

INNER-OUTER FINNED HEAT TRANSFER TUBES

Sung Chul Kim, Des Plaines, Ill., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Jan. 2, 1970, Ser. No. 287
Int. Cl. F28f *1/42*
U.S. Cl. 165—179 8 Claims



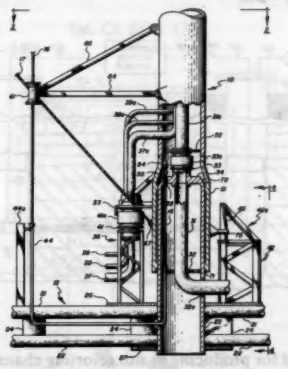
Inner-outer finned heat transfer tubes are provided for use in heat exchangers. The heat transfer tubes include a central core body surrounded by a tubular member. The central core has a plurality of integral elongated fins extending along the length of the core and projecting outwardly therefrom. The tubular member has a plurality of externally protruding fins on the outer surface thereof.

3,696,864

UNDERSEA RISER STRUCTURE

Walter Brown, Long Beach, Calif., assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Oct. 24, 1969, Ser. No. 869,078
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 6 Claims



A means, which allows a multipipe riser to be remotely connected to a base located on the ocean floor from a floating

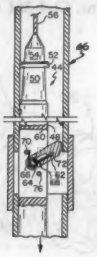
vessel, has, formed on the base, a fixed rigid vertical post and, formed on the riser, a column at the lower end thereof which column mates with the post. A pulldown line is threaded through a suitable structure on the base from a surface vessel and attached to the column on the riser so that the column can be pulled down over the post by pulling on the line. Since various pipes in the riser need to communicate with specific pipes in the base, the riser and base have means for rotating the riser on a vertical axis as the column engages the post to orient azimuthally the riser to the base.

3,696,865

END-OF-TUBING LOCATOR

Ronald W. Chapman, Metairie, La., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 11, 1970, Ser. No. 71,558
Int. Cl. E21b *47/00*
U.S. Cl. 166—64 **10 Claims**



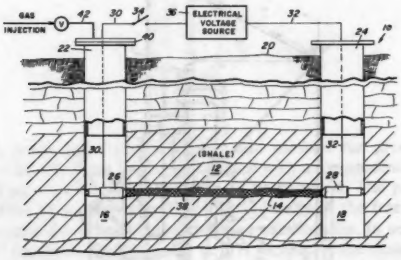
An end-of-tubing locator is disclosed for locating the end of a tubing string depending in a well. Although conventional end-of-tubing locators hang up in tubing joint recesses when the locator is withdrawn through the tubing string without performing its normal sequence of operations, the disclosed locator has the ability to disengage from such recesses for further upward movement.

3,696,866

METHOD FOR PRODUCING RETORTING CHANNELS IN SHALE DEPOSITS

Julian R. Dryden, Laramie, Wyo., assignor to The United States of America as represented by the Secretary of the Interior

Filed Jan. 27, 1971, Ser. No. 110,090
Int. Cl. E21b *43/00*
U.S. Cl. 166—248 **7 Claims**



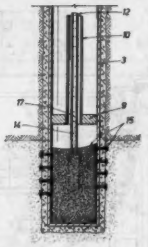
A method for producing in situ retorting channels in subterranean shale deposits. Electro-pneumatic treatment is used for lean shale. Additional electro-chemical treatment is required for rich shale.

3,696,867

RESIN CONSOLIDATED SANDPACK

J. M. Waid, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 3, 1971, Ser. No. 112,191
Int. Cl. E21b *43/04*
U.S. Cl. 166—276 **10 Claims**



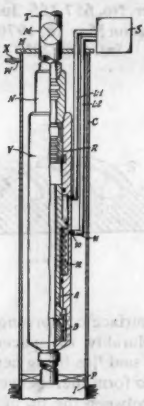
In sandpacking a cased and perforated well completed into an unconsolidated reservoir, a slurry of sand grains that are coated with a self curing epoxy resin formulation is pumped into the well by a procedure that ensures the filling of perforations and formation voids with a mass of resin-coated sand which will consolidate downhole and subsequently be drilled out to leave the interior of the casing free of obstructions.

3,696,868

WELL FLOW CONTROL VALVES AND WELL SYSTEMS UTILIZING THE SAME

Donald F. Taylor, Jr., Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 18, 1970, Ser. No. 99,534
Int. Cl. E21b *33/00*
U.S. Cl. 166—315 **24 Claims**



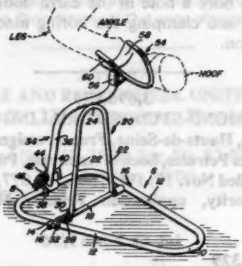
A valve for installation in a flow conductor for controlling flow of fluids through the conductor, which may be controlled from a remote point and which may act automatically as a safety valve, including means for positively propping the valve in the open position to hold the same in such open position when desired, for performing various well service operations through the valve, for taking the valve out of operation permanently or for flowing the well without affecting operation of the valve, and further including means for locating and operating a supplemental flow control valve at such point in the flow conductor. Also includes a releasable restraining device for holding the valve in the open position which is movable to a position freeing the valve for normal functioning.

3,696,869

HOOF MAINTENANCE STAND

Fred H. Anding, P.O. Box 921, West Monroe, La.

Filed Dec. 9, 1970, Ser. No. 96,533
Int. Cl. A01l *07/00*
U.S. Cl. 168—44 8 Claims



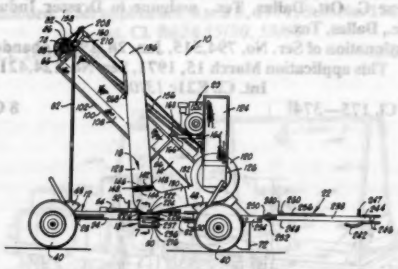
A folding leg-elevating, supporting and hoof maintaining device for use by a farrier, a blacksmith or an experienced person skilled in trimming, shoeing and hoof maintenance work. The device is characterized by a simple, practical and convenient-to-use stand, that is, a stand which when set up for use serves to suspend the ankle and hoof of the animal's leg. Using this stand the user does not have to lift and hold the animal's foot in position when trimming or shoeing. Nor does he have to rely on one hand and his own body as a support. Instead he has both hands free with the weight of the animal's leg elevated and supported whereby he is enabled to perform the work on the hoof with greatest speed, accuracy and precision. It will be noted that the construction and arrangement of component parts is such that they can be collapsed and folded into compact form for carrying, handling and storage.

3,696,870

APPARATUS FOR SEPARATING PELLETIZED LEAD OR THE LIKE FROM GRANULAR COMPOSITIONS SUCH AS SOIL

James L. Hinson, Arkansas City, Kans., assignor to Three Way, Inc., Oklahoma City, Okla.

Filed Jan. 4, 1972, Ser. No. 215,362
Int. Cl. A01d *17/02*
U.S. Cl. 171—17 8 Claims



An apparatus for separating pelletized material or relatively high specific gravity from a heterogeneous granular material of relatively low specific gravity which includes a blower having inlet and outlet, a duct communicating with the outlet of the blower and having the opposite end thereof extending upwardly from the blower, a plurality of spaced parallel bars extending across the duct and secured thereto, a conduit communicating with the duct at a point above the bars for conveying a mixture of the pelletized material and the heterogeneous granular material into the duct, a receptacle communicating with the duct at a point below the bars for receiving and holding the pelletized material which has been separated from the granular material and a motor connected to the blower for driving the blower and causing air to be blown thereby through the duct and over the bars. There is further disclosed a frame upon which the previously described apparatus is supported and which further carries a scoop for engaging the surface of the ground, a conveyor for conveying the mixture of granular material and pelletized material scooped from the ground in an upward direction, and a sifting apparatus for separating excessively large and excessively small pieces or particles of the granular material from the mixture of the granular material and the pelletized material as the mixture passes therethrough from the conveyor to the conduit.

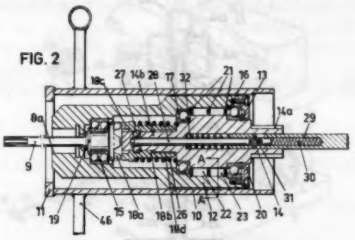
3,696,871

ROTARY POWER TOOL HAVING AUTOMATIC TORQUE SHIFT

Johan Runar Stenbacka, Sodertalje, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed July 6, 1970, Ser. No. 52,421
Claims priority, application Sweden, July 7, 1969, 9611/69
Int. Cl. B25b *23/14*
U.S. Cl. 173—12 12 Claims

FIG. 2



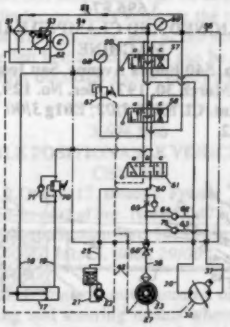
A rotary pneumatic torque tool such as a non-impacting nut runner, a screw driver or like tool, having means for automatic torque shift between a motor unit and an output shaft, said shift being obtained in response to the torque required for rotating a threaded member to be fastened, whereby the threaded member is first rotated at high speed and low torque and, when a predetermined reaction torque at the threaded member is exceeded, at low speed and high torque to reduce the total time for securing the threaded member.

3,696,872

DRILL STRING JOINT BREAKING MEANS

Nils Gunnar Jonsson, Benoni, Republic of South Africa, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 28, 1971, Ser. No. 147,988
Claims priority, application Sweden, June 15, 1970, 8254/70
Int. Cl. E21c *1/10*
U.S. Cl. 173—149 12 Claims



A rock drill has a chuck which is arranged to be displaced along a feed bar by means of a feed motor. The chuck is of the

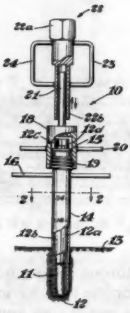
kind which is hydraulically actuated and grips the drill pipe when pressurized and it is rotated by means of a reversible hydraulic motor having two alternative supply conduits. The chuck is connected to the supply conduit for providing reverse rotation by means of a conduit in which a delaying valve is arranged. Thus, when the supply conduit for providing reverse rotation is pressurized upon actuation of a manually operated valve, the drill pipe being firmly held by a drill pipe holder, the delaying valve delays the supply of hydraulic fluid to the chuck until the hydraulic rotation motor and thereby the chuck has started its backward rotation so that the kinetic energy of the chuck and the motor is utilized for breaking a drill string joint located between the holder and the chuck.

3,696,873

SOIL SAMPLING DEVICE

Gene A. Anderson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed March 31, 1971, Ser. No. 129,781
Int. Cl. E21b *11/02, 49/02*
U.S. Cl. 175—20 **7 Claims**



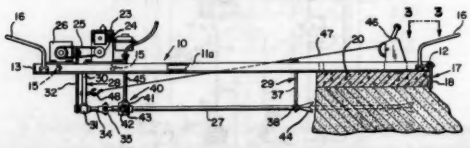
Basic components of the device disclosed herein are a sample tube, driver sleeve, driver cap and driver head. The sample tube is a pipe which is split lengthwise into two semicircular sections. In assembled position, i.e. during the soil collecting function, the split sample tube is a unitary tube which fits inside a larger pipe that defines the driver sleeve. The driver cap is an internally threaded cup-shaped member with an upstanding solid stem thereon and a crosswise handle. The cap is secured to the upper end of the driver sleeve by external threads on the sleeve. The driver head is a one-piece member comprising a solid block, a hollow stem which fits over the solid stem of the driver cap, and loop-type handles. The loop handles enable the driver head to be lifted up and down, so that the driver stem can hammer down against the cap and thereby drive the sleeve and sample tube into the earth.

3,696,874

OPERABLY ALIGNED AND CLAMPED EARTH BORING MACHINE

Dale U. Brinkman, 540 Bonita Avenue, San Jose, Calif.

Filed March 30, 1971, Ser. No. 129,374
Int. Cl. E21b *3/02*; E01g *3/00*
U.S. Cl. 175—122 **7 Claims**



The earth boring machine includes a stationary horizontally disposed frame with guide tracks to straddle a trench next to a pavement. A shaft for a drill bit, supported under the frame, is driven by a motor mounted on a carriage riding on the guide tracks. A pavement aligning member connects to one end of the frame to extend downward over the side of the pavement under which the earth is to be bored. A carriage driver pulls the carriage towards the pavement aligning member and pulls the frame against the side of the pavement in order to enable the drill bit to bore a hole in the earth under the pavement while aligning and clamping the boring machine during the boring operation.

3,696,875

DIAMOND-STUDDED DRILLING TOOL

Abel C. Cortes, Hauts-de-Seine, France, assignor to Compagnie Francaise des Petroles, Societe Anonyme, Paris, France

Filed Nov. 17, 1969, Ser. No. 877,341
Claims priority, application France, March 9, 1969, 6907864
Int. Cl. E21b *9/36*
U.S. Cl. 175—329 **19 Claims**

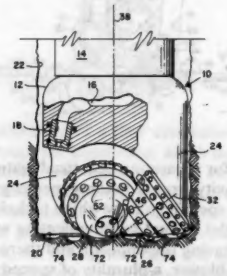
A high output drilling tool for earth of any nature, the drilling tool having openings for the injection of sludge and protuberances distributed over the end surface whose average height is several times greater than its average thickness and which have attack edges for tearing away earth.

3,696,876

SOFT FORMATION INSERT BITS

Eugene G. Ott, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 794,515, Jan. 28, 1969, abandoned.
This application March 15, 1971, Ser. No. 124,421
Int. Cl. E21c *13/00*
U.S. Cl. 175—374 **8 Claims**



A rotary drill bit is disclosed that is utilized in forming a well bore or the like. The rotary drill bit includes a bit body having three arms journaling three generally conical cutter members. Each of the cutter members is provided with a plurality of an-

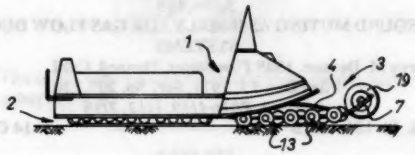
nular rows of outwardly projecting, circumferentially-spaced inserts. The inserts are constructed from a material such as tungsten carbide and project from the surface cutter members for a considerable distance. The spacing of the annular rows is such that a substantial quantity of the bottom of the well bore is not subjected to the downward impression of the inserts as the bit is rotated in the well bore. The cutter members are arranged in such a manner that the axes thereof do not intersect each other nor do they intersect the axes of rotation of the bit.

3,696,877

SNOWMOBILE AND ROAD WHEEL UNITS THEREFOR

Jules Dessureault, 2292 Lavergne, Shawinigan, Quebec, Canada

Filed Nov. 23, 1970, Ser. No. 92,052
Int. Cl. B62m *27/00*
U.S. Cl. 180—5 R **6 Claims**



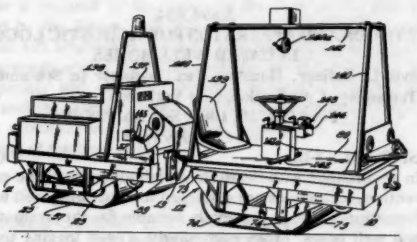
Road wheel units adapted to support the front end of a snowmobile in replacement of the usual skis and a snowmobile arranged with one or two such units to adapt the same for use elsewhere than in snow and on ice. An elongated road wheel unit having a series of wheels along each lateral side, the wheels along one side being staggered relative to the wheels along the other side, the wheels at each end of the unit being arranged such that they do not normally engage the ground, whereby generally only two wheels touch the ground at any-one time for relatively easy steering of each unit and the wheels are closely spaced to provide a smooth side by avoiding joltily rocking or wobbling of the unit about the pitch axis thereof.

3,696,878

BELT TRACTION VEHICLE

Stanford C. Nelson, 8 South Merrill Avenue, Park Ridge, Ill.

Continuation of Ser. No. 41,735, June 1, 1970, abandoned, which is a continuation of Ser. No. 740,328, June 26, 1968, abandoned. This application April 5, 1971, Ser. No. 131,522
Int. Cl. B62d *55/30, 53/00*
U.S. Cl. 180—9.46 **15 Claims**



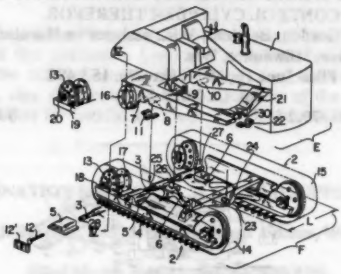
Traction vehicle in which a traction unit and a steering unit are connected together by a universal connection enabling the two units to pivot about longitudinal and transverse axes. Each unit is supported on endless flexible traction devices trained about low pressure rubber tires and maintained under tension by tension idlers forming guides for the flexible traction devices. The wheel base of the wheels of each unit is shorter than the distance between the transverse centers of the endless traction devices and the four wheels of the traction unit are power driven by a reversable drive connection. Steering and the controls for the traction unit are on a platform on the steering unit held in alignment with the traction unit by the universal connection. Steering is attained by turning the steering unit relative to the platform.

3,696,879

HEAVY BULLDOZER

Akio Terai; Eiji Kawamura; Hisashi Fukumoto, and Hidekatsu Aoki, all of Osaka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 26, 1970, Ser. No. 40,555
Claims priority, application Japan, May 31, 1969, 44/42663; Oct. 15, 1969, 44/81879
Int. Cl. B62d *55/06*
U.S. Cl. 180—9.48 **5 Claims**



The present invention relates to heavy bulldozer which comprises connecting the right and left belt assemblages through laterally horizontal pivot shaft in such a manner that said belt assemblages can be independently moved up and down, providing upper half circular bearing on the rear lower surface of the body, sealing said bearing with the lower half circular bearing cap capable of connecting or disconnecting said bearing, providing the upper half circular bearing on the front lower surface of the body on the equalizer pin provided in the center of the equalizer bar for connecting the right and left truck frames, and sealing said bearing with removable lower half circular bearing cap wherein said heavy bulldozer can be disassembled into main body portion and the endless track portion, and can be freely transported by reducing the weight and the height thereof, providing bolt or cylinder to be screwed into the end of the above mentioned pivot shaft, on said end surface of the pivot shaft, so that the interval between the right and left belt assmblages can be changed by operating said bolt or cylinder, to easily separate the main body portion and the endless track portion, and at the same time the width of the right and left belt assemblages can be reduced to the effect that the heavy bulldozer can be easily transported.

3,696,880

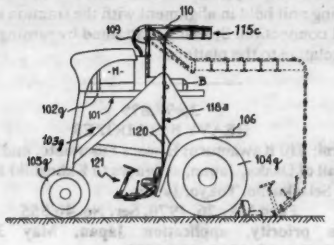
REMOVABLE POSITIONABLE VEHICLE CONTROL CENTER

Emile Bobard, P.O. Box 17, Beaune, France

Continuation-in-part of Ser. No. 652,472, July 11, 1967, abandoned. This application Dec. 12, 1969, Ser. No. 884,523
Int. Cl. B60k *29/00*
U.S. Cl. 180—77 R **15 Claims**

A self-contained control unit mounted on a motor vehicle including driving and steering means wherein a control unit for remotely operating the driving and steering means includes at least partially hydraulic flexible pipe lines which are sup-

ported by a pivotal arm connected at one end thereof to an upright equipped with height-regulating means and at the other end to a deformable sheath provided with a terminal spout curved downwardly.

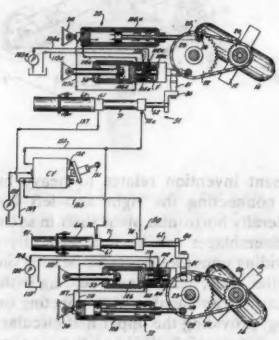


3,696,881

VEHICLE STEERING SYSTEM OF THE FLUID POWER TYPE AND SPRING CENTERED, SPRING MODULATED CONTROL CYLINDER THEREFOR

Richard O. Gordon, Belgium, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed June 16, 1971, Ser. No. 153,492
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 R **8 Claims**



A vehicle steering system having a pair of fluid power cylinders for simultaneously actuating each wheel of a pair of steerable wheels, and also having a control cylinder for one of the power cylinders of each pair to cause said power cylinders to be actuated to different extents, consequently producing angular rotation of said steerable wheels in like directions, but in different amounts.

An improved spring centered and spring modulated control cylinder which is extended at a different rate than it is contracted.

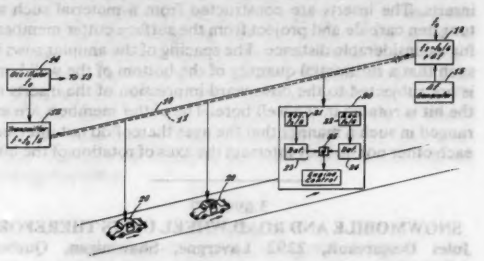
3,696,882

METHOD FOR GUIDING VEHICLES AUTOMATICALLY ALONG A PREDETERMINED PATH

Helmut Martin, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Jan. 27, 1971, Ser. No. 110,063
Claims priority, application Germany, Feb. 13, 1970, P 20 06 581.0
Int. Cl. B60k *31/00*
U.S. Cl. 180—98 **9 Claims**

Low rate propagation of descrete phase points between two oppositely propagation and slightly detuned frequencies is used for motion control of vehicles along a prescribed path.

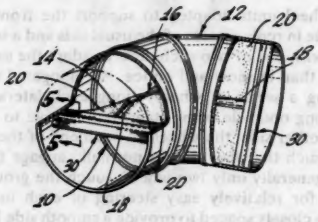


3,696,883

SOUND MUTING ASSEMBLY FOR GAS FLOW DUCT SYSTEMS

Harry M. Devane, 1549 Pine Street, Oxnard, Calif.

Filed Dec. 13, 1971, Ser. No. 207,220
Int. Cl. F01n *1/10, 1/12, 7/18*
U.S. Cl. 181—36 B **14 Claims**



A sound muting assembly comprising a bar extending longitudinally through a duct, and a series of longitudinally spaced, laterally projecting vane supports which are angularly spaced from each other to define a helical path twisting about the bar. In one embodiment, the supports hold a sound muting vane comprising two twisted rectangular sheets of sound absorbing material spiraling around the bar on opposite sides thereof, and in another, two such vanes, each comprising two sheets, are supported to spiral about the bar in angularly spaced relation.

3,696,884

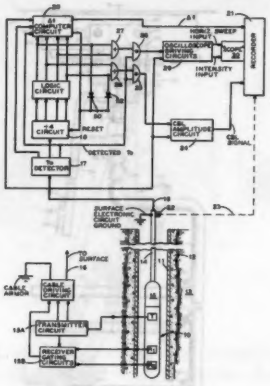
METHODS AND APPARATUS FOR ACOUSTIC LOGGING IN CASED WELL BORES

Clovis L. Lafleur, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,694
Int. Cl. G01v *1/34*
U.S. Cl. 181—5 B **7 Claims**

In accordance with illustrative embodiments of the present invention, techniques are disclosed for providing well logging information which is especially suitable for the evaluation of cased well bores. More particularly, a well logging tool has two acoustic receivers spaced apart from a repetitively energized acoustic transmitter. The amplitude of a selected portion of each electrical signal produced by the receiver nearest the transmitter in response to the emitted energy and the time for such energy to travel to this near receiver is measured to produce logs of the travel time to this near receiver and the bonding of the casing to the cement which surrounds it. The electrical signals produced by the receiver farthest from the transmitter are used to produce a variable density log which

can be used in conjunction with the cement bond log to evaluate the bonding of the cement to both the casing and formations. The travel time log can be used to evaluate the accuracy of the other two logs.

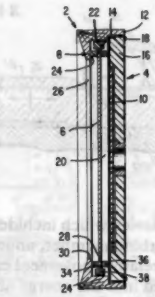


3,696,885

DECORATIVE LOUDSPEAKERS

Donald D. Grieg, Caldwell, N.J., and Herbert Schoengold, Mount Vernon, N.Y., assignors to Electronic Research Associates, Inc., Cedar Grove, N.J.

Filed Aug. 19, 1971, Ser. No. 172,979
Int. Cl. H04r *1/28*; G10k *13/00*
U.S. Cl. 181—31 B **12 Claims**



A loud-speaker assembly is provided with a frame, a loud-speaker is secured to the frame at the rear of the opening defined by the frame, a decorative member embodying stiff material and adapted to function as a sound propagating element extends across the opening in the frame in front of the loud-speaker and yieldable material is located between the frame and the marginal portion of the decorative member to permit vibration of the decorative member in response to operation of the loud-speaker.

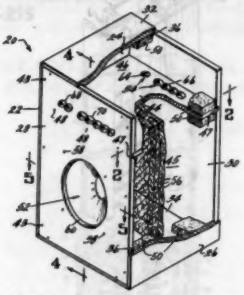
3,696,886

SPEAKER CABINET ENCLOSURE AND METHOD OF TUNING THEREOF

James C. Armstrong, 4017 Springrock Drive, Colerain Township, Hamilton County, Ohio

Filed May 3, 1968, Ser. No. 726,517
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B **6 Claims**

A speaker enclosure comprising a rectangular parallelepiped, main and auxiliary resonating chambers therein, a speaker unit mounted in the front wall of the enclosure forming the main resonating chamber, the chambers being separated by a baffle plate; tuned ports are disposed in the baffle plate adjacent the rear wall of the enclosure, these tuned ports providing communication between such chambers; tuned ports disposed in the front wall of the enclosure providing for communication of the auxiliary chamber with the exterior of the enclosure. Layers of insulation are provided within the cabinet enclosure as shown and described. The number, size, distribution and configuration of the indicated ports provide for faithful and clear reproduction of sound.

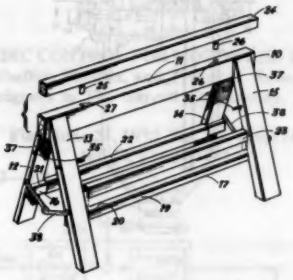


3,696,887

COMBINATION SAWHORSE, SCAFFOLD SUPPORT AND TABLE

Jerome J. Brzykcy, 10323 W. Woodward Avenue, Wauwatosa, Wis.

Filed March 4, 1971, Ser. No. 120,810
Int. Cl. A47b *37/00*
U.S. Cl. 182—28 **1 Claim**



A combination saw horse, scaffold support and table including a false removable top element for the upper beam of the saw horse, horizontal braces for the leg elements provided with inverted channel cappings as a metal scaffold support means, and a demountable table top for the top beam.

3,696,888

COMBINATION PORTABLE FIRE ESCAPE AND WARDROBE SUPPORT

Fred L. Brandenberger, 49 Rivoli Street, San Francisco, Calif.

Filed July 8, 1971, Ser. No. 160,644
Int. Cl. E06c *1/38*, *1/36*, *7/00*
U.S. Cl. 182—35 **6 Claims**

A rigid ladder section is equipped with hooks and rod attachment for hanging over the outside a window sill. One rung of the ladder section is rotatable and carries a rolled up rope or rope ladder which may be released to the ground from high

elevations. When not in use as a fire escape the rigid section is equipped with supporting feet and the hooks serve to steady

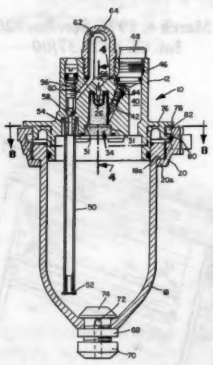
the rod so as to serve as a support for clothes hangers and similar wardrobe holding devices.

3,696,889

AIR LINE LUBRICATOR

Cecil Clifford Brake, Raleigh, N.C., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 31, 1970, Ser. No. 68,117
Int. Cl. F16n 7/34
U.S. Cl. 184—55 A 3 Claims



An air line lubricator has a resilient flapper which normally closes about a venturi oil feeding passage. The flapper may act in either direction upon the passage of a large flow to permit bypass of the venturi. A simple retaining ring with a pivoted latch holds the reservoir on the lubricator housing.

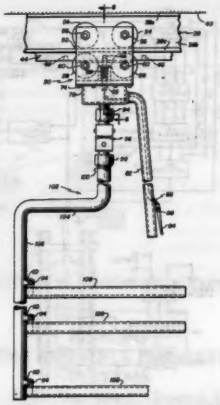
3,696,890

ARTICLE DELIVERY SYSTEM

Gilbert Armstrong, 5N 432 Neva Terrace, Itasca, Ill.

Filed May 5, 1970, Ser. No. 48,772
Int. Cl. E04h 3/04
U.S. Cl. 186—1 6 Claims

An aisle delivery system operable in limited traffice areas such as the passenger aisle in a commercial aircraft, said system permitting delivery of food and beverages by placing trays on pallets pivoted to a bracket depending from an overhead carrier which moves along a conveyor track fixed to the upper part of the fuselage. Means are provided to immobilize the overhead carrier at selected positions along the conveyor track, and a universal joint is provided between the bracket and the overhead conveyor to counteract angular flight



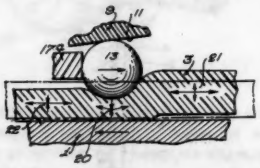
changes. Junction means connect the main conveyor track to branch tracks which lead to service areas or the like.

3,696,891

ENERGY ABSORBING DEVICE

Lloyd Richard Poe, Beverly Hills, Calif., assignor to The Hartwell Corporation, Los Angeles, Calif.

Filed Oct. 29, 1970, Ser. No. 85,001
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C 32 Claims



An energy absorbing device which includes a deformable or elastomeric energy absorbing member, an indenting element, and means for effecting relative movement causing the indenting element to be pressed into the energy absorbing member; the energy absorbing member being restrained against translation movement but otherwise not bonded so that, on relative movement of the energy absorbing member indenting elements, the indenting element not only causes localized deformation of the energy absorbing member, but also subjecting the energy absorbing member to tension loads and compressing loads throughout substantial areas at opposite sides of the region of localized deformation so that energy absorbtion is distributed over a substantial region.

3,696,892

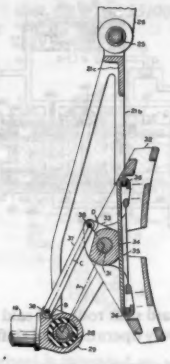
BRAKE HEAD-CENTERING DEVICE FOR RAILWAY BRAKE APPARATUS

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation

Filed Feb. 8, 1971, Ser. No. 113,280
Int. Cl. F16d 65/06
U.S. Cl. 188—212 4 Claims

The disclosure concerns brake apparatus for railway cars and locomotives in which the brake head is journaled on a pivoting hanger and is centered by a biasing spring. The hanger is moved by an elongated actuating member having a substantially fixed orientation with respect to the horizontal,

and a four-bar parallelogram linkage orients the seat of the biasing spring relative to the actuating member so as to main-



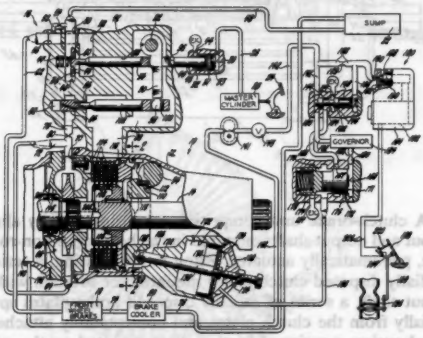
tain alignment of the head with respect to the braking surface of the wheel during pivotal movement of the hanger.

3,696,893

BRAKE AND COOLING SYSTEM

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1971, Ser. No. 114,601
Int. Cl. F16d *65/84*
U.S. Cl. 188—264 E **3 Claims**



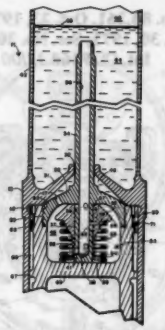
A brake and a cooling system including brake discs mounted in part on a transmission output shaft and secured in part on the transmission housing for stopping the rotation of the output shaft when the discs are engaged, a source of coolant, and means for automatically providing coolant to the brake discs during such braking conditions. An additional brake-engaging device, utilizing the above-mentioned brake discs, is employed to stop the rotation of the output shaft in response to a fluid pressure signal indicative of a substantially zero throttle opening. When front wheel disc brakes are employed, either a vane- or centrifugal-type pump is mounted on the output shaft and supplied with coolant from the above source by a manual brake pedal-actuated valve for cooling the disc brakes.

3,696,894

ACCELERATION SENSITIVE SHOCK ABSORBER VALVE

Jack C. Brady, and Kenneth J. Fewel, both of Arlington, Tex., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 2, 1971, Ser. No. 159,319
Int. Cl. F16f *9/24, 9/342*
U.S. Cl. 188—275 **16 Claims**



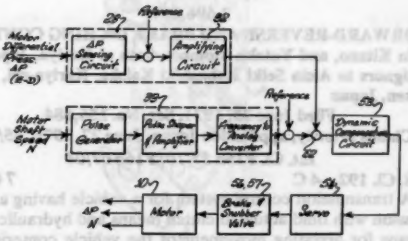
The invention disclosed is a pressurized air-oil, telescopically configured, shock absorber of the type that may be incorporated in an aircraft landing gear or other devices subject to high structural stresses caused by high impact loadings. It consists of a substantially conventional shock absorber modified to include a control valve assembly which programs the opening and closing of the piston position controlling metering orifice thereof by means of a unique valve sleeve normally spring-urged toward a closed metering orifice condition but positioned to effect the opening thereof in proportion with the magnitude of the acceleration to which it is exposed during the impact loading of the aforesaid landing gear or other devices.

3,696,895

FLUIDIC CONTROL FOR MOTOR AND BRAKE

David J. Schaffer, Phoenix, and Trevor G. Sutton, Maricopa, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed June 24, 1971, Ser. No. 156,274
Int. Cl. F16d *67/00*
U.S. Cl. 192—3 R **8 Claims**



This system controls the operation of a jet engine thrust reversing mechanism of the type operated by a reversible fluid motor. The control system is of the fluidic character having a first circuit portion for sensing the pressure differential at the inlet and outlet of the fluid motor and consequently the torque being exerted at any particular time and a second circuit portion for providing a pulsating signal with a frequency dependent upon the speed of the fluid motor. These signals are combined and dynamically compensated, the result being applied to a servo which controls the application of fluid pressure to

actuators for snubbing and braking the fluid motor. The system is used primarily near the terminations of the deploying and stowing phases of operation of the thrust reversing structure.

3,696,896

LOCK-UP DEVICE FOR FLUID UNIT

Stoddard C. Hamilton, III, 375 Wardlow Road, Highland, Mich.

Division of Ser. No. 83,361, Oct. 23, 1970. This application Nov. 30, 1971, Ser. No. 203,375

Int. Cl. F16d *33/00*

U.S. Cl. 192—3.28 **5 Claims**

Hydrodynamic unit having a lock-up device to prevent slip of the rotors subsequent to the attainment of a predetermined input speed. In one form of the invention camming balls are moved outwardly on special ramps in response to rotary drive of the input by centrifugal force of predetermined magnitude to effect the drive engagement of an input driven locking plate and a turbine member. The locking plate is moved from drive engagement with the turbine member by spring means when the magnitude of the centrifugal force developed by the balls is reduced to a predetermined value for torque transmittal through the hydraulic unit. In another form of the invention a centrifugally operated valve closes off an oil exit port of a hydraulic pump operatively disposed between the input and output of the converter or coupling at predetermined input speeds to hydraulically lock the pump and lock-up the hydrodynamic unit. As the magnitude of the centrifugal force developed by the valve diminishes to a predetermined value, spring means moves the valve to open the discharge port so that the pump pumps fluid therethrough allowing the hydraulic operation of the hydrodynamic unit.

3,696,897

FORWARD-REVERSE AND BRAKE INCHING CONTROL

Shin Kitano, and Yutaka Momose, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

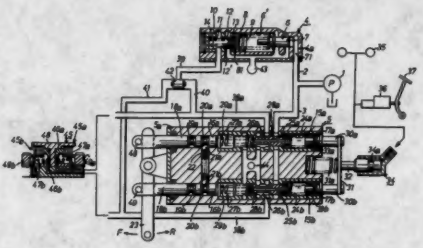
Filed June 25, 1971, Ser. No. 156,684

Claims priority, application Japan, June 27, 1970, 45/56234

Int. Cl. F16h *57/10*; F16d *67/04*

U.S. Cl. 192—4 C **7 Claims**

A transmission control system for a vehicle having a transmission with fluid actuated clutch means and hydraulic brake means for arresting movement of the vehicle comprising, a source of pressurized fluid, a fluid pressure conduit communicating said pressurized fluid to the clutch means, and control valve means disposed within said conduit. The control valve means may comprise a housing provided with a pair of cylindrical bores, a pair of spool valves slidably engaged respectively within said bores to form pressure chambers disposed within said conduit and to control selectively passageways of pressurized fluid through said conduit to engage and disengage the clutch means, a pair of inching pistons slidably engaged within said bores through resilient members interposed between said inching pistons and said spool valves, means for connecting said brake means with said inching pistons, a pair of shift rods slidably engaged within said bores through resilient members



interposed between said shift rods and said spool valves, and a shift lever for selectively operating said shift rods.

3,696,898

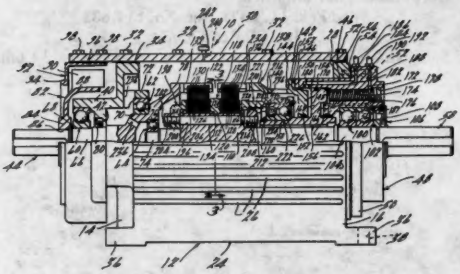
CLUTCH-BRAKE UNIT

Gordon M. Sommer, Groose Pointe Woods, Mich., assignor to G. M. Sommer Co., Inc., Detroit, Mich.

Continuation of Ser. No. 809,461, March 6, 1969, abandoned. This application Sept. 18, 1970, Ser. No. 73,665

Int. Cl. F16d *67/04*

U.S. Cl. 192—18 A **17 Claims**



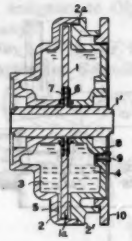
A clutch-brake unit comprising a housing, axially aligned input and output shafts mounted in the housing, a non-rotatable, pneumatically actuated piston in the housing, a series of radially disposed clutch plates mounted for rotation with the input shaft, a series of radially disposed brake plates spaced axially from the clutch plates and non-rotatably attached to the housing, a series of friction discs mounted on the output shaft for rotation therewith and adapted for selective frictional engagement with the clutch and brake plates, a clutch actuating member and a brake actuating member carried on the output shaft adjacent the clutch and brake plates, means extending between the last two members, whereby the members are movable together axially of the output shaft, with movement thereof in one direction serving to simultaneously frictionally engage the clutch plates with certain of the friction discs and to release the remaining friction discs from frictional engagement with the brake plates, and with movement thereof in the other direction serving to simultaneously release the clutch plates from the frictional engagement with certain friction discs and to frictionally engage the remaining friction discs with the brake plates, and spring means mounted in one end of the housing and normally urging the piston toward a position wherein the last mentioned means effects engagement of the brake and release of the clutch.

3,696,899

LEAK-PROOF FLUID COUPLING

Robert Michael Kongelka, Houston, Pa., assignor to Viewlex, Inc.

Filed Dec. 9, 1970, Ser. No. 96,367
Int. Cl. F16d *35/00*
U.S. Cl. 192—58 B 2 Claims



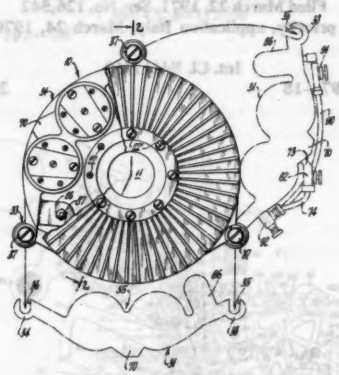
A driving rotor wheel is mounted on a shaft. The shaft and rotor are rotatably mounted in a relatively large hollow housing which comprises the driven part of the coupling. The housing has an annular interior recess into which the periphery of the driving wheel extends. The housing is only partially filled and the fluid drive coupling takes place between the wheel and the housing in the area of the recess. In operation, the fluid is urged by centrifigal force to the recessed area. There is never any fluid at the shaft-housing interface, and, therefore, there is no leakage.

3,696,900

PIVOTED AND REMOVABLE POD MOUNTING FOR BRAKES AND CLUTCHES

Edwin J. Montalvo, c/o Montalvo, P.O. Box 653, 379 Union Street, Hackensack, N.J.

Filed July 29, 1970, Ser. No. 59,188
Int. Cl. F16d *13/38*
U.S. Cl. 192—70 10 Claims



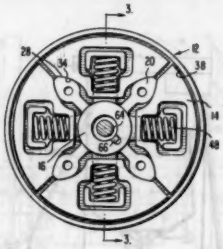
An improvement in a pivoted mounting system for a frictional brake or clutch which facilitates access to working parts for inspection and maintenance. Three sector shaped bodies or pods carry friction members operable to contact relatively rotatable plates. Each of the sector shaped pods is independently outwardly pivotable about either of its ends to expose the working parts. The pivot arrangement includes hooks on each end of each sector shaped pod for rotation about a pivot pin. Each sector shaped pod may alternatively be lifted out of the mechanism entirely by disengagement of the hooks of both ends from their pins.

3,696,901

CENTRIFUGAL CLUTCH

Charles Frederick Henry, Carson, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 30, 1970, Ser. No. 85,344
Int. Cl. F16d *43/24*
U.S. Cl. 192—105 BA 5 Claims



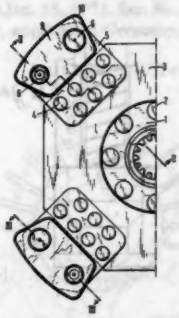
A centrifugal clutch including a U-shaped shroud which supports and partially houses a generally radially extending clutch shoe spring. The shroud cooperates with a clutch shoe mounting aperture to house and surround the spring, yet permit circumferential displacement of the clutch shoe relative to the shroud and a clutch hub. This circumferential displacement permits clutch hub carried cam means to exert clutching force on the clutch shoe, augmenting centrifugal clutching force acting on the clutch shoe.

3,696,902

CLUTCH DISC WITH METALLIC FRICTION FACINGS

Johann Dantele, Schwebheim, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed July 14, 1971, Ser. No. 162,519
Claims priority, application Germany, July 24, 1970, P 20 36 761.7
Int. Cl. F16d *13/69*
U.S. Cl. 192—107 C 9 Claims



The opposite friction facings of solid metal or sintered powder metal on the driven disc of a friction clutch are mounted on respective, normally convex faces of pairs of carriers which are symmetrical relative to a radial plane and are prevented from bulging apart by rivets which also fasten the facings to the carriers. The convex faces are directed in opposite axial directions, and the rivets pass through them along lines which are farthest from corresponding lines on the other carrier of the pair.

3,696,903

WASHING OR OTHER MACHINES

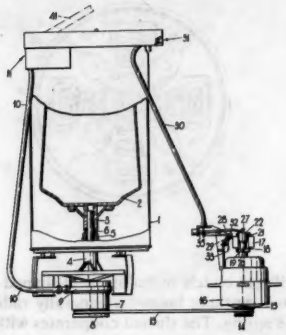
Barry Herbert Nethersell, Deganwy, Wales, assignor to British Domestic Appliances Limited, Peterborough, England

Filed Oct. 16, 1970, Ser. No. 81,407

Claims priority, application Great Britain, Oct. 20, 1969, 51,301/69

Int. Cl. F16d 67/00; D06f 39/14

U.S. Cl. 192—136 8 Claims



A spin dryer for clothes, or an upright clothes washing machine in which the clothes drum rotates to dry clothes is provided with a lid which is locked at all times when the drum is rotating, the lock mechanism being actuated by bob-weights which are thrown outwards when a drive motor for the drum is rotating. The mechanism also includes an interlock which prevents the motor being energized unless the lid is closed and a control lever is correctly set.

3,696,904

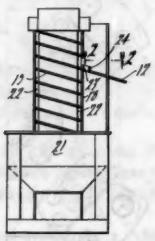
WORK FEEDING TRACK FOR T-SHAPED PARTS

Milford A. Campbell, 17225 McArthur, Detroit, Mich.

Filed Sept. 23, 1970, Ser. No. 74,659

Int. Cl. B23q 7/12

U.S. Cl. 193—43 R 12 Claims



The track is located adjacent to a parts deliverying device so formed as to cause the parts not properly oriented and supported to fall therefrom. The track has two rails spaced apart for the reception of the stem of the parts while the enlarged ends or heads rest on the top thereof. The track slopes sufficiently to have the parts slide downwardly therealong and has a bend therein in the sloping plane thereof to cause those parts not properly supported to fall therefrom when passing thereover. A dip or deflection may be placed in the outside rail at the bend to further assist in the falling of the improperly supported part from the track.

3,696,905

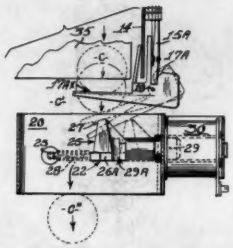
COIN ESCROW MEANS AND CIRCUIT

Roman A. Tojza, Chicago, and Frank C. De Simone, Rolling Meadows, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Aug. 27, 1970, Ser. No. 67,478

Int. Cl. G07f 5/10

U.S. Cl. 194—9 6 Claims



An escrow attachment adapted for use with known types of coin testing chute having one or more coin switches actuated by an accepted coin departing from a guideway or exit to lodge upon and tilt a switch-actuating lever arm and in so doing operate the appertaining coin switch. The "escrow" or holding of the coin is effected by means of a reciprocable escrow slide underlying the switch levers and in a normal position limiting the tilt of the lever in a way to cause the coin to remain upon the lever until such time as a control circuit energizes a release solenoid shifting the escrow slide to permit the switch lever to tilt still farther and effect discharge and collection of the coin.

3,696,906

CHARACTER SELECTING DEVICE FOR A PRINTING MECHANISM

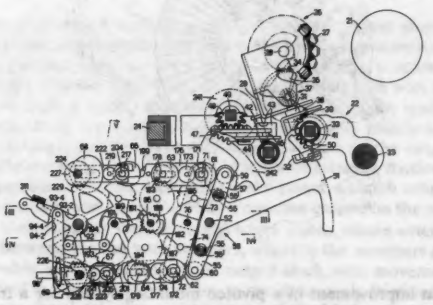
Rinaldo Salto, Ivrea Turin, and Domenico Roano, Parella Turin, both of Italy, assignors to Ing. C. Olivetti & C. S.p.A., Ivrea (Turin), Itiay

Filed March 22, 1971, Ser. No. 126,542

Claims priority, application Italy, March 24, 1970, 68007 A/70

Int. Cl. B41j 1/60

U.S. Cl. 197—18 24 Claims



A character selecting device for a printing mechanism comprising a type-bearing element having a set of characters selected in accordance with the combination of a plurality of binary code units. Each code unit is associated with a selector cam rotatable between a first position and a second position. Each selector cam is in turn carried by a shaft, and at least one of the selector cams is so interconnected with at least one of the other shafts to cause the other shaft to shift perpendicularly to its axis when the one cam rotates from the first to the

second position. Output means are engaged by the cam carried by the other shaft to move the type-bearing element to select the character to be printed.

3,696,907

SEGMENT GUIDE FOR TYPEWRITERS AND SIMILAR MACHINES

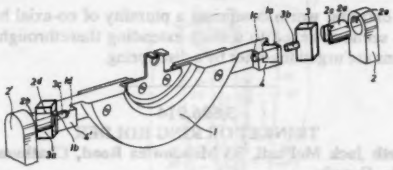
Georg Werner, Heidmuhle, and Detlef Kunst, Sanderbusch, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed May 8, 1970, Ser. No. 35,663

Claims priority, application Germany, May 14, 1969, D 19 24 602.7

Int. Cl. B41j 7/22

U.S. Cl. 197—41 **6 Claims**



A segment guide for typewriters and similar machines having a pin defining a prism-shaped recess mounted on the machine frame, and a slide element which cooperates with the prism. The slide element is rotatably adjustably mounted on the segment by a pin.

3,696,908

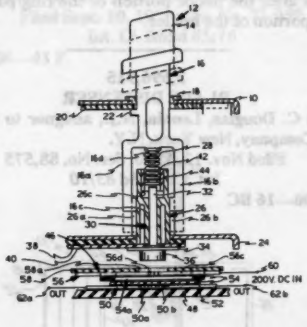
CAPACITIVE KEY

Julius Gluck, Stamford, and Raul Lara, Norwalk, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,024

Int. Cl. B41j 5/08

U.S. Cl. 197—98 **14 Claims**



This is a capacitive keying device suitable for use in an electronic keyboard. Depression of the key drives a stem which stresses a spring beyond the release threshold of a magnetic latch. A projectile is then fired, impacting upon a flexible sheet capacitor electrode. The resulting electrode deflection causes a momentary increase in capacitive coupling.

3,696,909

DRIVING MECHANISMS FOR MOVING STAIRWAYS

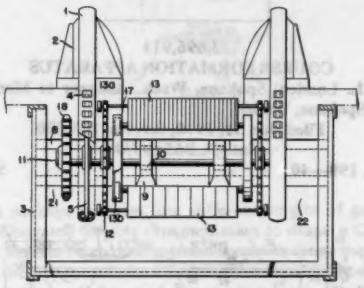
Mikiharu Kojima, Tokyo, and Tetuo Iwata, Kanagawa-ken, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 8, 1970, Ser. No. 96,219

Claims priority, application Japan, Dec. 10, 1969, 44/116716; Jan. 20, 1970, 45/5513

Int. Cl. B65g 9/12

U.S. Cl. 198—16 **4 Claims**



In a driving mechanism for a moving stairway including moving hand rails and moving steps along a truss, there are driving wheels for driving the hand rails and sprocket wheels for driving the steps on a common driven shaft mounted on the truss.

The wheels and sprockets are rotated at the same speed as the shaft causing the moving hand rails and moving steps to be driven in synchronization. Those parts of the surface of the shaft disposed near its both ends are carried on bearing to provide a sufficient clearance between said both ends and the inner walls of the trusses facing said ends, thereby permitting easy fitting and detachment of the endless moving hand rail.

3,696,910

ARRANGEMENT FOR RE-ORIENTATING ROD-SHAPED OBJECTS

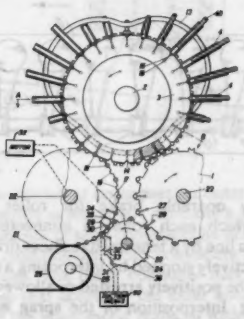
Alfred Schmermund, Gevelsberg, and Rudolf O. Scholz, Westfalen, both of Germany, assignors to Maschinefabrik Alfred Schmermund, Gevelsberg, Germany

Filed Jan. 15, 1971, Ser. No. 106,834

Claims priority, application Germany, Jan. 31, 1970, P 20 04 369.0

Int. Cl. B65g 47/24

U.S. Cl. 198—33 AC **8 Claims**



An arrangement for re-orientating filter tipped cigarettes comprises a drum conveyor provided with a set of individually pivotable holders for the cigarettes. These pivotable holders are arranged around the circumference of the drum and a plu-

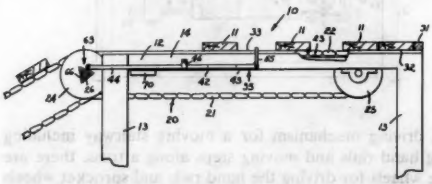
rality of corresponding fixed holders are longitudinally aligned with the first mentioned holders. The pivotably mounted holders engage a three-dimentionally arcuate rod surrounding the drum axis and, as the drum rotates, each of the pivotable holders engages the rod and is angularly displaced thereby through 180° until it overlaps the corresponding fixed holder. Both the sets of holders are connected to suction means which is so co-ordinated with the drum rotation that a cigarette is held in each pivotable holder until it overlaps the corresponding fixed holder, then the cigarette is transferred to the corresponding fixed holder an held therein until released from the drum.

3,696,911

COURSE FORMATION APPARATUS

Sidney L. Lunden, Spokane, Wash., assignor to Moore-Iem, Inc., Spokane, Wash.

Filed Dec. 31, 1970, Ser. No. 103,020
Int. Cl. B65g *43/08*
U.S. Cl. 198—40 **9 Claims**



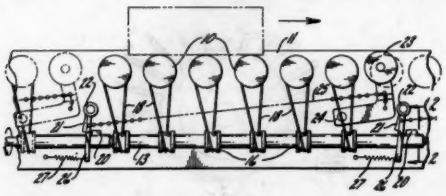
A course formation apparatus is disclosed having an article feed for conveying the articles to a course formation station. A stop means projects into the path of the articles to engage and stop the movement of one of the articles to form a first article in the course. A bobbing finger element periodically projects into the path of the articles at an upstream position to determine if the position is occupied by a stationary article that has built up behind the first article of the course indicating that a full course has been formed.

3,696,912

BRAKE FOR ROLLER CONVEYORS

Fred J. Fleischauer, Oakmont, Pa., and Theodore Hammond, Grand Haven, Mich., assignors to Ermanco Incorporated, Grand Haven, Mich., by said Hammond and General Logistics Corporation, Oakmont, Pa., by said Fleischauer

Filed May 5, 1969, Ser. No. 842,047
Int. Cl. B65g *13/02*; F16d *13/04*
U.S. Cl. 198—127 **15 Claims**



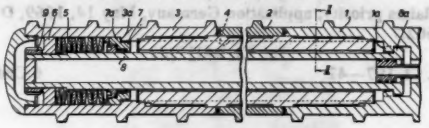
A selectively operable brake for roller conveyors is described in which each roller is connected to a pulley beneath the pass line by a tensioned resilient drive belt and the pulleys are selectively stopped by interposing a sprag. The pulleys may either be positively arrested or allowed to frictionally slip for braking. Interposition of the sprag is controlled by means which permit the device to function as an accumulation conveyor while permitting accumulated objects to be released individually or in groups. The device is usable as a powered live-roller accumulation conveyor or without power as a gravity conveyor.

3,696,913

EXTRUDER WORMS FOR EXTRUDING SYNTHETIC RESINS

Dietmar Anders, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed April 3, 1970, Ser. No. 25,458
Claims priority, application Germany, April 19, 1969, G 69 15 822
Int. Cl. B65g *33/00*
U.S. Cl. 198—213 **1 Claim**



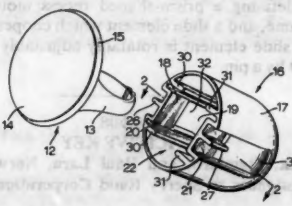
An extruder worm comprises a plurality of co-axial hollow worm sections keyed to a shaft extending therethrough. The sections are urged together by a disc spring.

3,696,914

TRINKET OR RING HOLDER

Kenneth Jack McPhail, 33 Meadowlea Road, Chatham, Ontario, Canada

Filed Nov. 28, 1969, Ser. No. 880,863
Int. Cl. B65d *1/00*
U.S. Cl. 206—1 R **1 Claim**



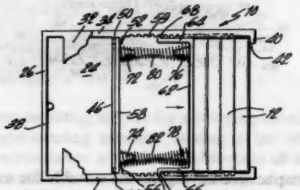
A cup-shaped holder for a ring or like trinket with inner surfaces which engage with and hold the annular part of the ring while the ring mount serves to close the mouth of the holder. The inner surfaces of the holder co-operate with the annular part of the ring to exert a compressive force on the ring which is removed after the major portion of the ring passes into an expanded portion of the holder.

3,696,915

BLADE DISPENSER

Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

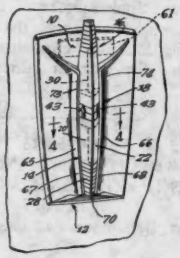
Filed Nov. 12, 1970, Ser. No. 88,575
Int. Cl. B65d *83/10*
U.S. Cl. 206—16 BC **5 Claims**



A blade dispenser for razor blades comprising a housing having a partition dividing the housing into a blade dispensing

compartment and a used blade receptacle. Double volute springs are disposed on truncated conical studs on the partition and a movable platen for feeding new blades to a position where they may be automatically seated in a razor. The housing has a slot therein and is provided with a baffle for receiving and retaining used blades.

3,696,916
THERMOMETER SET
Allen Penniman, Glendale, and Elmer A. Koenig, Kirkwood, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Aug. 4, 1969, Ser. No. 847,318
Int. Cl. B05d *85/20*
U.S. Cl. 206—16.6 7 Claims

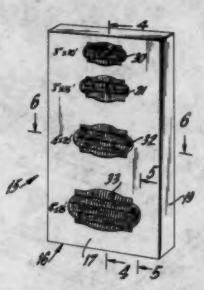


A thermometer container and holder assembly of plastic construction adapted to be placed at the patient's bedside wherein the thermometer container consists of a tapered three-sided base which receives a push-on stopper at the upper end thereof and a cover also receivable on the stopper of identical construction to the base, there being provided a wall or table mounted support for the container that resiliently grasps the container with sufficient force so that if desired the container cover may be removed without the removal of the entire container from the support.

3,696,917
TOBACCO POUCH CLOSURE
Elaine G. Levi, 400 East Randolph Street, Chicago, Ill.
Filed Sept. 10, 1970, Ser. No. 71,059
Int. Cl. B65d *85/16*
U.S. Cl. 206—41 F 6 Claims

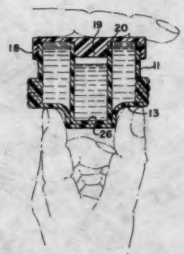
A receptacle closure comprising a pair of resilient beads secured to opposite walls of a receptacle adjacent the receptacle opening. The beads are located on the receptacle walls in a manner such that when the receptacle is closed one bead overlaps and snugly engages the other bead to form a tight seal.

3,696,918
CHRISTMAS TREE ORNAMENTATION PACKAGE
Charlotte F. Lerner, Brooklyn, N.Y., assignor to Small World Importing Corp., New York, N.Y.
Filed March 23, 1971, Ser. No. 127,244
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.31 11 Claims



This package contains four different lengths of garland or other elongated flexible ornamentation to drape a Christmas tree at various levels, and to make it easy to drape the tree. To drape the upper end of a Christmas tree, a shortest length of ornament is used. As you drape at lower levels, the lengths of the ornamentation increase. Also the garland for upper levels are of less diameter than the garlands for the lower levels. The package comprises a box that contains separate holders for each length of garland. The holders are of uniform dimension from side to side to fit into a box of uniform width. All the holders are of uniform height to fit the height (or thickness) of the box. A holder holding a greater length of garland is of greater dimension lengthwise of the box than a holder holding a shorter garland. To facilitate use, the box has a window to expose part of the garland on each holder with the windows differing in size corresponding to the lengths of the garlands on said holders.

3,696,919
DOUBLE CONTAINER WITH MIXING MEANS
Gilbert DeWayne Miles, Ossining, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 8, 1970, Ser. No. 96,104
Int. Cl. B65d *79/00*
U.S. Cl. 206—47 A 8 Claims



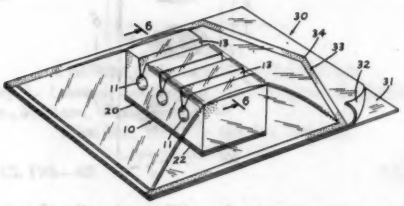
The double container comprises an outer container having positioned therein substantially centrally a smaller inner container. Each mouth of both containers lie in approximately the same plane. Additionally, both containers are closed by the same single cap. The outer container may be longitudinally compressed so that access to the inner container may be obtained due to the elastomeric material with which at least the lower portion of the outer container is constructed. The inner container may be removed from its closed position to expose the contents therein to the contents in the outer container all within the outer container.

3,696,920

DEVICE FOR ORGANIZING OBJECTS

Charles Arthur Lahay, North Kingston, R.I., assignor to International Paper Company, New York, N.Y.

Filed Oct. 15, 1970, Ser. No. 81,063
Int. Cl. A61b *15/00*, *19/02*; B65d *81/00*
U.S. Cl. 206—63.2 R 14 Claims



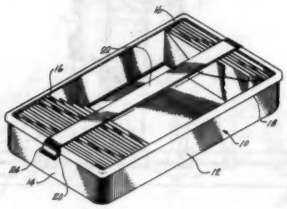
A device is provided for organizing objects such as, for example, surgical instruments which comprises a block of a semi-rigid foam containing therein one or more channels of a configuration adapted to retain the object therein, a beveled slot providing communication between the surface of the block and the channel, the width of the slot narrowing as it approaches the channel, and means for adhesively securing an outer surface of the block to a suitable supporting surface. The object is inserted through the beveled slot into the channel where it is retained in a locked position until needed. The object is then removed for use from the channel by expanding the slot sufficiently to permit the object to be withdrawn from the channel through the slot. The device is conveniently packaged sterile in a strippable sterile enclosure.

3,696,921

RESTRAINING TAPE FOR MAIL PACKAGING

Matthew J. Desmond, 2105 Lorraine Road, San Marino, Calif.

Filed Nov. 5, 1970, Ser. No. 87,273
Int. Cl. B65d *1/34*, *63/00*
U.S. Cl. 206—73 2 Claims



There is described an arrangement for transporting first-class letters in which the letters are stacked edgewise in an elongated plastic tray. A paper band of sufficient length to bridge the length of the tray and to provide end portions which overlap the sides of the tray is provided, with a pressure-sensitive adhesive on the end portions for securing the tape in place to hold the letters in the tray.

3,696,922

FLOTATION OF COPPER AND NICKEL SULFIDES FROM TALCOSE BEARING ORES

David Weston, 34 Parkwood Avenue, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 873,911, Nov. 3, 1969, which is a continuation-in-part of Ser. No. 727,268, May 7, 1968, Pat. No. 3,596,838. This application March 5, 1970, Ser. No. 16,946
Claims priority, application Canada, Nov. 7, 1969, 67,006.The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.
Int. Cl. B03b *1/04*; B03d *1/06*
U.S. Cl. 209—5 3 Claims

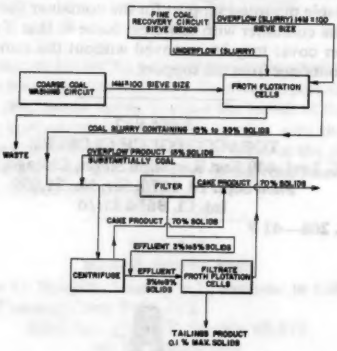
A method for the flotation of nickel and copper sulphide minerals from talcose bearing ores using an alkaline circuit in which at least one of the alkaline reagents is soda ash or ammonium hydroxide and following conditioning of the pulp with a collecting agent of the xanthate family to activate the nickel and copper sulphide materials, the pulp is conditioned with a flocculating agent to depress the host rock minerals and in which following flotation the rougher concentrate is further conditioned with a dispersant or a flocculant prior to the first cleaner float.

3,696,923

METHOD FOR RECOVERING FINE COAL AND COAL-CONTAINING PARTICLES IN A COAL RECOVERY CIRCUIT

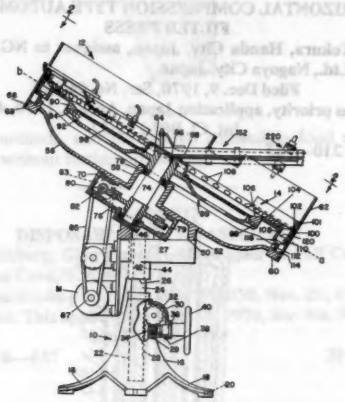
Francis G. Miller, Bethlehem, Pa., assignor to Bethlehem Steel Corporation

Continuation of Ser. No. 703,362, Feb. 6, 1968, abandoned, and a continuation of Ser. No. 861,908, Sept. 29, 1969, abandoned. This application July 28, 1970, Ser. No. 59,013
Int. Cl. B03b *7/00*
U.S. Cl. 209—12 1 Claim



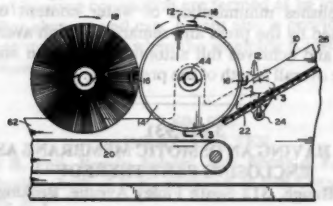
Improved method of treating a fine coal slurry from a coarse coal washing circuit and/or a slurry from a fine coal recovery circuit wherein the slurries are passed to a first froth-flotation step to recover a substantial portion of the fine particles of coal therein as a froth product, dewatering the froth product to obtain a cake product containing usable coal and an effluent containing substantially all finely divided coal particles. The effluent is passed to a second series of froth-flotation cells wherein the fine particles of coal are removed as a second froth product and substantially clean water is recovered as the tailings product. The second froth product is returned to the recovery circuit wherein the fine particles of coal are recovered. The tailings product may be recycled if desired.

3,696,924
CAP FEEDING APPARATUS
Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Filed Jan. 25, 1971, Ser. No. 109,126
Int. Cl. B07c 5/34
U.S. Cl. 209—73 53 Claims



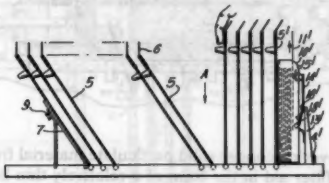
Apparatus comprising a hopper containing a sorting table supported in an inclined position so that a mixed mass of caps deposited in the hopper at the lower edge of the table are carried upwardly by rotation of the table to the level of the upper edge where there is a discharge passageway to which the caps are adapted to be led in single file for transportation to a capping machine and peripherally distributed pockets, guide rails and jets arranged to capture certain of the caps and orient them for entrance into the discharge passage while discarding others.

3,696,925
SEAFOOD SORTER
Foye H. Harper, P.O. Box 352, Newberg, Oreg.
Filed Aug. 24, 1970, Ser. No. 66,451
Int. Cl. B07c 3/04
U.S. Cl. 209—109 3 Claims



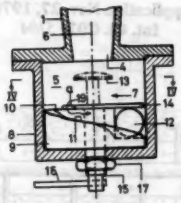
A mass of seafood chuncks is placed on a chute having a reciprocating spreader which spreads the mass on the chute and hooks on a drum are moved through the lower edge of the mass to hook individual chunks and then drop the chunks onto a conveyor, a rotary brush assisting to strip the chunks from the hooks.

3,696,926
COMBINED FEEDING AND SORTING DEVICE FOR SHEET MATERIAL
Finn Kohler Syversen, Solveien 4 A, 1820 Spydeberg, Norway
Filed April 21, 1971, Ser. No. 135,941
Claims priority, application Norway, April 23, 1970, 1555/70
Int. Cl. B07c 7/02
U.S. Cl. 209—122 4 Claims



A sorting device having divider cards and a supply tray mounted on a base for receiving sheets. A feeding device for sheets is associated with the tray, so that when the cards are separated to form a filing pocket, the feeding device automatically projects the first exposed sheet from the supply tray. The cards are releasably retained in the base by a displaceable lock rail operable from the front of the base.

3,696,927
HYDROCYCLONE
Karl Folke Olof Jakobsson, Taby, and Bo Ake Forsner, Vallentuna, both of Sweden, assignors to Aktiebolaget Celleco, Tumba, Sweden
Filed Feb. 10, 1970, Ser. No. 9,685
Claims priority, application Sweden, Feb. 23, 1969, 1950/69
Int. Cl. B04c 5/16
U.S. Cl. 209—211 2 Claims

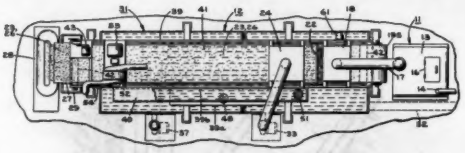


A discharge chamber of circular cross-section extends axially from the vortex chamber and has at one end an inlet from the vortex chamber and at the other end a bottom provided with an outlet, the discharge chamber also having a central axis around which the heavy fraction separated in the vortex chamber is rotated in one direction while passing from said inlet to said bottom, the outlet being located below the plane of the bottom. The bottom has an open discharge groove communicating with the outlet and leading therefrom with a gradually diminishing cross-sectional area in said one direction along the circular side wall of the discharge chamber through an angle less than one revolution; and a covering disc is disposed in close parallel relation to the bottom plane and is movable around the central axis, this disc having a recess in its peripheral portion and otherwise covering said bottom substantially entirely.

3,696,928
METHOD OF RECOVERING SOLID PARTICULATE MATERIAL FROM A LIQUID

William N. Schjerven, Jr., Bellwood, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,939
Int. Cl. B01d *37/02*
U.S. Cl. 210—75 5 Claims

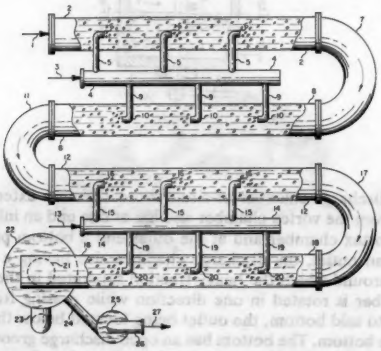


In recovering copper solid particulate material from a rinse water, a filter aid in the form of a relatively thin layer of the solid particulate material is initially formed on a portion of an indexable filter media. This is accomplished by combining solid particulate material of the type which is to be recovered, with water, to produce a relatively thick slurry. This slurry is passed through the filter media and the material which filters out is subsequently leveled to a predetermined uniform depth to form the filter aid layer or bed. The rinse water then is passed through the filter aid and the underlying portion of the filter media, which cooperate to remove solid particulate material from the rinse water. Subsequently, as the filter media is indexed, a filter aid layer is formed on succeeding portions thereof and the filtered solid particulate material and the solid particulate material forming its associated filter aid layer are removed therefrom. After removal of the solid particulate material from the filter media, the media may be incinerated to recover any particulate material embedded therein or adhering thereto.

3,696,929
APPARATUS FOR THE OXIDATION OF LIQUIDS

Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Division of Ser. No. 730,294, May 20, 1968, Pat. No. 3,549,314. This application Nov. 27, 1970, Ser. No. 73,385
Int. Cl. C02c *5/04*
U.S. Cl. 210—199 9 Claims

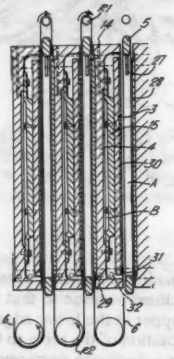


Black liquor is oxidized in a sinuous pipe or duct oxidizer, by dispersing an oxygen-containing gas into the continuous black liquor phase flowing within the duct. The gas is passed into the black liquor at spaced intervals, and the resulting dispersion of gas in oxidized black liquor is discharged into a vessel or other container below the level of the body of liquor in the vessel. Fully oxidized black liquor is removed from the vessel at a regulated rate, so as to maintain the level of liquor in the vessel, and oxygen-depleted gas is also removed from the vessel. The oxygen-depleted gas removed from the vessel may contain residual foam or entrained liquid droplets. In this case, the gas is passed through a mechanical foam breaker or a cyclonic gas-liquid separator, with separated black liquor being recycled to the vessel.

3,696,930
HORIZONTAL COMPRESSION TYPE AUTOMATIC FILTER PRESS

Tadao Tokura, Handa City, Japan, assignor to NGK Insulators, Ltd., Nagoya City, Japan

Filed Dec. 9, 1970, Ser. No. 96,545
Claims priority, application Japan, April 4, 1970, 45/28271
Int. Cl. B01d *25/32*
U.S. Cl. 210—225 8 Claims



A horizontal compression type automatic filter press for filtering and squeezing slurry through an endless filter cloth, comprises filter plate open and close means for opening and closing all of filter plates simultaneously, diaphragms each having a main portion, which is secured to a movable filter plate, being thicker than the periphery of the diaphragm secured to a stationary filter plate, double surface filter plates each providing a filtration resistance difference between opposite surfaces thereof, filter cloth transfer means having two sets of rollers arranged one above the other, the diameter of the one set of rollers above arranged being smaller than that of the other set of rollers. The filter press according to the invention accomplishes minimization of water content of filter cakes obtained by the press and remarkably high average filtering rates and achieves full automatic operation and shortening of the overall length of the press.

3,696,931
VESSEL HAVING AN OSMOTIC MEMBRANE AS AN ENCLOSING PART THEREOF

William T. Hough, 312 South Finley Avenue, Basking Ridge, N.J.

Continuation-in-part of Ser. No. 442,122, March 23, 1965, abandoned, and a continuation-in-part of Ser. No. 813,376, Feb. 26, 1969, Pat. No. 3,532,621. This application April 16, 1969, Ser. No. 816,765
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—244 15 Claims

A cup having an osmotic membrane as a cover for an opening in the bottom or side of the cup for a process for desalinization of sea water by regular (natural) osmosis of

water from sea water into a comestible food which is neither separable by volatilizing nor separable from liquid phase water

by other methods, and the diluted comestible food may be consumed without further processing.

3,696,932

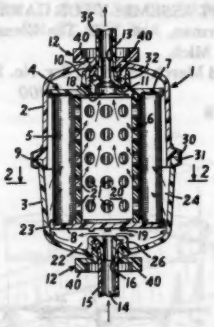
DISPOSABLE FILTER ASSEMBLY

David Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 779,050, Nov. 26, 1968, abandoned. This application Sept. 30, 1970, Ser. No. 76,833

Int. Cl. C02c 1/14

U.S. Cl. 210—437 **39 Claims**



A disposable filter assembly is provided with a leakproof connection between the filter element and the filter housing to prevent external leakage, and a direct fluid connection between the interior of the filter element and one fluid line, thereby ensuring that unfiltered fluid will not by-pass the filter element and contaminate the downstream fluid line. In the preferred embodiment the fluid line connection and the filter element-housing connection are formed as an integral part of one filter element end cap. A vent also is provided to release air from the assembly when the assembly is installed and put on-stream.

3,696,933

INERTIA FILTER

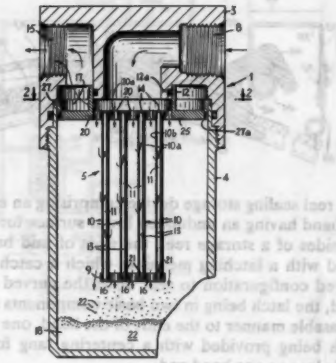
David B. Pall, Rosyln Estates, and Bernard F. Silverwater, Plainview, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 780,097, Nov. 29, 1968, abandoned. This application June 15, 1970, Ser. No. 46,054

Int. Cl. B01d 29/00

U.S. Cl. 210—444 **15 Claims**

An inertia filter is provided in which a high velocity flow of influent fluid is directed along the surface of the filter via a flow injector at a minimum velocity head loss of at least 2 psi across the flow injector. The inertia filter is positioned in a housing across the line of flow from the inlet to the outlet such that part if not all flow from the inlet to the outlet must pass through the inertia filter, and all flow to the outlet must pass through the inertia filter or another filter. The flow injector constrains and directs the flow at a selected surface portion of the inertia filter at high velocity of at least 20 ft./sec., in a manner to maintain an inertial flow component along the surface of the filter, to retain particles in the fluid and inhibit the lodging of particles on the filter surface. A sump is preferably provided in the housing to retain and collect contaminant particles swept along and off the surface of the filter, if the inertia filter is the only filter, but a sump is not needed if supplemental filters are provided in addition to the inertia filter.



3,696,934

APPARATUS FOR CENTRIFUGALLY SEPARATING IMPURITIES FROM FLUID SUSPENSIONS

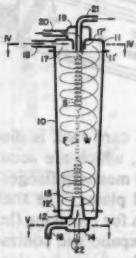
Saburo Oisi, 7-1, 6-chome Oguro, Shizuoka-shi, Japan

Filed Jan. 24, 1968, Ser. No. 700,135

Claims priority, application Japan, Sept. 2, 1967, 42/56498

Int. Cl. B01d 21/26

U.S. Cl. 210—512 **2 Claims**

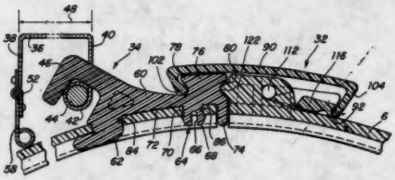


An apparatus for removing objectionable impurities from a fluid suspension of pulp or paper-making material in the manufacture of paper. The apparatus comprises a cylindrical separating chamber through which flows a fluid suspension vortex containing high and low density impurities whereby the impurities are centrifugally separated as a function of their density. The most dense impurities are flung radially outwardly from the fluid suspension vortex whereby they are entrained and carried away by a water vortex which encircles the fluid suspension vortex and advances through the separating chamber in a direction opposite to that of the fluid suspension vortex.

3,696,935
REEL SEALING AND STORAGE APPARATUS

Carl J. Dean, Southbridge, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed Dec. 24, 1969, Ser. No. 887,962
Int. Cl. A47f 7/00
U.S. Cl. 211—13 20 Claims

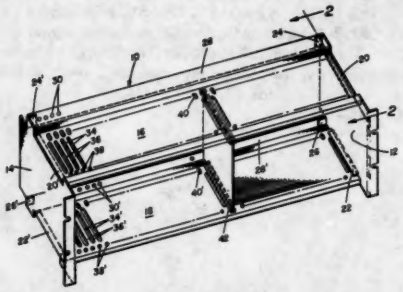


A reel sealing storage device comprising an elongated flexible band having an undulated lower surface for engaging with the sides of a storage reel, the ends of said band being provided with a latching means in which a catch member is of curved configuration to seat upon the curved surface of the band, the latch being in two basic components assembled in a releasable manner to the ends of the band, one element of the latch being provided with a centering tang for mating with guide legs on one band end.

3,696,936
PRINTED CIRCUIT CARD RACK

William J. Straccia, Allentown; Brooke E. Gernert, Topton, and Ronald B. Sherer, Allentown, all of Pa., assignors to Electro-Space Fabricators, Inc., Topton, Pa.

Filed Dec. 15, 1970, Ser. No. 98,222
Int. Cl. A47g 19/08
U.S. Cl. 211—41 8 Claims



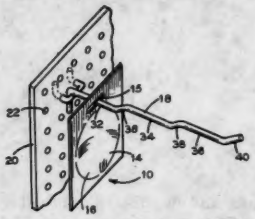
A printed circuit card rack is disclosed having end plates and shelf members, which are accurately positioned by and secured together by means of flanges and tabs forming integral portions of the end plates. The shelf members are provided with holes and slots for receiving flexible snap-in card guides which are free to expand and contract so as to accommodate printed circuit cards of varying size. The shelf members are further provided with maximum air flow circulation vents extending between each pair of adjacent card guides.

3,696,937
HANGER BRACKET FOR MERCHANDISE

Leslie Braverman, Spring Valley, N.Y., assignor to Solo Products Corporation, Englewood, N.J.

Filed Dec. 15, 1969, Ser. No. 885,016
Int. Cl. A47f 7/00
U.S. Cl. 211—54 10 Claims

A hanger bracket holds packages of merchandise in such a manner that the quantity of merchandise on the bracket at any time is easily visible and quickly ascertainable for inventory control by unskilled help. The bracket is removably mounted on a pegboard and has a stepped finger for holding groups of packages at different levels. Another embodiment uses two

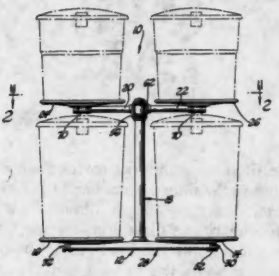


fingers with one finger holding the merchandise and the second finger having telescopic sections biased for urging the merchandise cards or packages forward towards the free end of the first finger. The second finger contains markings or indicia for reordering purposes.

3,696,938
SUPPORT ASSEMBLY FOR GARBAGE CANS

Donald W. Sherman, Apt. 520, The Glens, 7335 Deep Run, Birmingham, Mich.

Filed March 18, 1971, Ser. No. 125,594
Int. Cl. A47g 29/00
U.S. Cl. 211—78 5 Claims



A support assembly of the type which may be utilized to support garbage cans, as in a homeowner's garage. The assembly includes a base having an H-shaped configuration. A pair of circular trays are welded to the sides of the H-shaped base. A tubular post is removably attached to the base by bolts and extends upwardly therefrom. A pair of support arms are rotatably supported at the top of the post by a pair of clevises and a circular tray is welded to the distal end of each arm.

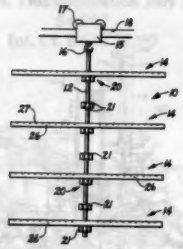
3,696,939
SMOKE TREE

Karl B. Drowatzky, 802 Prairie Park Road, Wichita, Kans.

Filed Jan. 4, 1971, Ser. No. 103,516
Int. Cl. A22c 15/00; A47f 5/08, 5/10
U.S. Cl. 211—117 9 Claims

A smokehouse meat rack which readily disassembles including a vertically hanging support rod and a plurality of

horizontally positioned stations each of which are coupled to the rod by a pair of vertical pins carried on the stations which releasibly engage a pair of corresponding sleeve members on the rod.

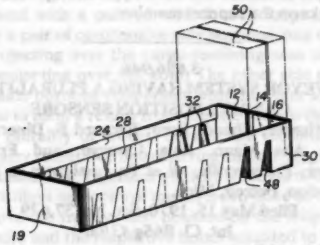


3,696,940

SUPPORT STRUCTURE

Louis S. Hoffman, Morristown, N.J., and Harry Spruyt, New York, N.Y., assignors to Beech-Nut, Inc., New York, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,800
Int. Cl. A47f 3/14
U.S. Cl. 211—126 **4 Claims**



Disclosed herein is a support structure formed from two adjacent walls. The structure can be utilized in tray containers to divide it into partial shelves. The shelves are formed by utilizing a portion of both sides of two adjacent walls which form the shelves and supports thereof.

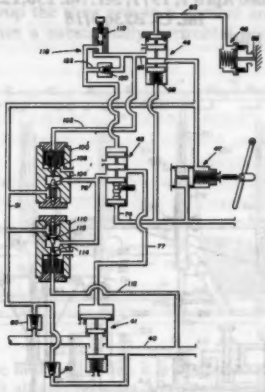
3,696,941

AUTOMATIC COUPLING SYSTEM FOR FREIGHT CARS

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 12, 1971, Ser. No. 142,657
Int. Cl. B61g 5/08
U.S. Cl. 213—76 **6 Claims**

An improvement in an automatic coupling system for a railway car which is equipped with a mechanical coupler, a main air line adapted to be connected to a corresponding air line of another railway car, a main valve interposed in the main air line, and means for actuating the main valve responsive to intentional coupling of the railway car. The improvement, in its preferred form, takes the form of a pair of pilot-operated check valves connected in parallel to the air conduit supplying the actuating means to prevent flow of air therethrough when the main air line is charged but uncoupled at one end, and to maintain the flow therethrough when coupled to another car but with either car having a faulty interface valve actuation which would normally allow the main valve to close.

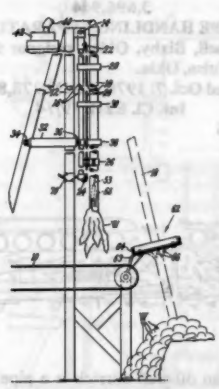


3,696,942

MEANS FOR TRANSFERRING SUCCESSIVE FLEXIBLE WORK PIECES

Charles J. Kitchener, and Paul G. Rumball, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Sept. 30, 1970, Ser. No. 77,177
Int. Cl. B66c 1/02
U.S. Cl. 214—1 BB **8 Claims**



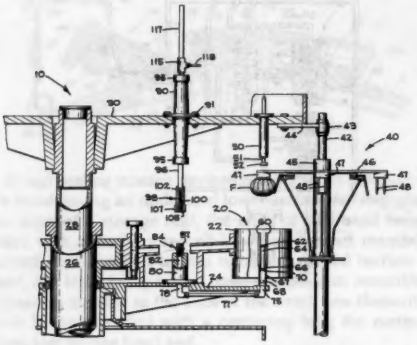
A device is powered for movement heightwise and laterally of a pile of work pieces, for instance articles of fabric or the like, and includes fluid pressure operated jaws for seizing and releasing successive single work pieces. The jaws are operative adjacent to a suctional opening in a work transferring member that contains a fluidically controlled circuit responsive to the change in pressure in the member, when its opening is restricted by a work piece, to effect closure of the jaws thereon. Arrival of the member with its clamped work piece at the release position causes the circuit to release the work piece.

3,696,943

FRUIT SUPPORTING APPARATUS

Charles T. Mulford, Auburndale, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed April 1, 1971, Ser. No. 130,122
Int. Cl. B23q 3/18
U.S. Cl. 214—1 BC 11 Claims



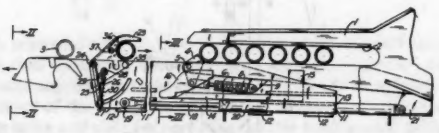
A fruit is arranged to be held upon a plurality of impaling pins with its top surface at a predetermined elevation regardless of the size of the fruit by means of a support for the lowermost surface of the fruit which support is slidably mounted with respect to the pins and is hydraulically controlled. Valve means are provided to permit the support to move vertically with the fruit when the fruit is placed in the proper position upon the pins and to prevent further movement of the support during subsequent processing operations performed upon the fruit.

3,696,944

PIPE HANDLING APPARATUS

Erwin A. Campbell, Bixby, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed Oct. 7, 1970, Ser. No. 78,890
Int. Cl. E21b 19/14
U.S. Cl. 214—2.5 7 Claims



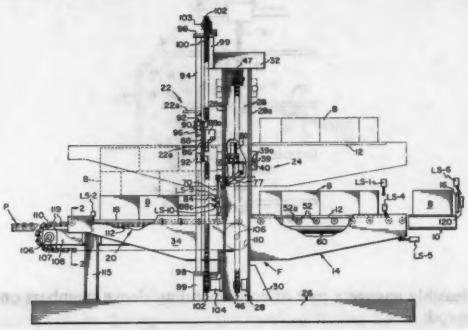
Positioned in an oil well derrick is a pipe carrier having a horizontal slot open at one end for receiving a stand of pipe that is to be moved laterally away from a well. Mounted on the carrier beside the slot for movement parallel thereto is a slide that has an outer end movable toward and away from the carrier. A hook is pivoted to the outer end of the slide for movement toward and away from it. For moving pipe into the slot, the hook is urged to project laterally away from the slide into a position facing the slot. When the slide is reciprocated, the hook pivots and slides past suspended pipe as the slide is moved outwardly so that when the slide is moved in the opposite direction the laterally projecting hook will carry the pipe into the slot. Provision also is made for using the slide and hook to deliver pipe from the carrier to a position above the well.

3,696,945

BLOCK CUBING APPARATUS

Elroy F. Bobolts, Alpena, Mich., assignor to Besser Company, Alpena, Mich.

Filed Dec. 9, 1970, Ser. No. 96,469
Int. Cl. B65g 57/10
U.S. Cl. 214—6 G 19 Claims



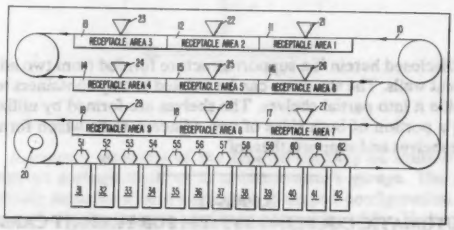
Block cubing apparatus for stacking tiers of blocks, such as cement building blocks, in cubes comprising: a support member on which the tiers of blocks are to be stacked, independently movable block height sensing mechanism engageable with the uppermost tier of blocks on the support member to positively locate the sensing mechanism relative to the uppermost tier of blocks thereon, and a block transfer system responsive to the sensing mechanism for moving tiers of blocks upwardly to the level ordained by the sensing mechanism and thence moving them laterally to a position in which they are released to and supported by the uppermost tier of blocks on the support member.

3,696,946

CONVEYOR SYSTEM HAVING A PLURALITY OF CARRIER POSITION SENSORS

James R. Hunter, Chadds Ford; Bernard B. Dinerman, Norristown; Abe Mann, Bala Cynwyd, and Franklin T. Schroeder, Phoenixville, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 15, 1970, Ser. No. 37,629
Int. Cl. B65g 43/00
U.S. Cl. 214—11 R 14 Claims



This disclosure relates to an automatic conveyor system having a plurality of sensors to detect the positions of the conveyor carriers so that the difference between a computed carrier position and its actual position will be less than the maximum tolerable error due to wear, stretch or slack in the conveyor belt or chain. At the time an article or parcel is placed in the conveyor system, its carrier designation and position of the destined receiving bin are stored in a memory. During each incremental time period, the contents of the memory are scanned and compared with counters associated with each position sensor. When a comparison is achieved, a signal is sent to the appropriate receiving bin to actuate the corresponding carrier to unload its contents.

3,696,947

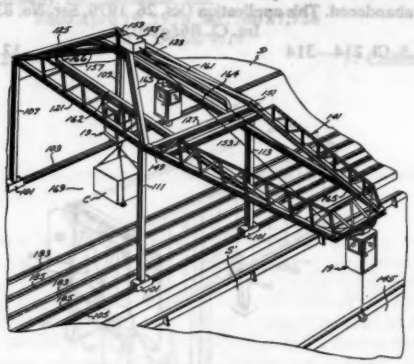
DOCK SIDE CARGO HANDLING APPARATUS

Catharinus M. Ponsen, Lomita, Calif., assignor to Colin Craig, Westminster, Calif., a part interest

Division of Ser. No. 812,537, March 12, 1969, Pat. No. 3,543,953, which is a continuation of Ser. No. 754,175, Aug. 21, 1968, abandoned. This application July 15, 1970, Ser. No. 54,907

Int. Cl. B63b *27/10*

U.S. Cl. 214—14 6 Claims



Cargo handling apparatus for transferring cargo between a cargo-receiving area on a dock and the hold of a ship moored alongside such dock. The apparatus includes a frame carried on mount means disposed on the dock and formed with a boom projecting outwardly over the side of the dock and over the hold of the ship. An endless track is carried from the frame and is formed with a pair of turned back loops connected together by a pair of coextensive side portions, one of the side portions projecting over the cargo-receiving area and one of the loops projecting over the hold. The other side portion of the pair of side portions cooperates with the other loop of the pair of loops to form a return from the one loop to the one side portion. A plurality of trolley devices are mounted on the track and carry respective hoists having cargo engaging means suspended therefrom. Operator platforms are carried from the respective trolleys and control means is provided so the operators can move the trolleys into position on the loop disposed over such hold and the respective hoists actuated to lower the load engaging means into such hold to retrieve cargo from the hold and then advance the trolleys over the return and onto the one side portion for lowering the cargo retrieved onto the load-receiving area.

3,696,948

LUMBER BIN SORTER WITH GUIDE SLING AND TILTABLE BIN FLOOR

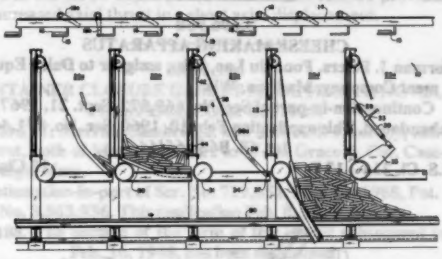
Kenneth E. Murdoch, Richmond, B.C., Canada, and Donald B. Turner, Portland, Oreg., assignors to Moore Dry Kiln Company of Oregon, North Portland, Oreg.

Filed Oct. 5, 1970, Ser. No. 77,962

Int. Cl. A24f *27/14*; B65g *47/18*

U.S. Cl. 214—16 B 6 Claims

A lumber bin sorter, of the type having a multiplicity of bins to which graded lumber is carried by an overhead conveyor and ejected into designated bin locations, wherein each of the bins is provided with a rotatable torque tube member positioned at the bottom of the bin stall adjacent to and extending laterally of a bin wall. Projecting out horizontally from the periphery of the tube member are a plurality of laterally spaced girders bridging the space between adjacent bin walls and serving as a floor for the bin. At the extended end of certain of the floor girders is pivotally connected a counterweighted sling arm which angles upwards and serves to cushion the impact and guide the positioning of the initial boards dropping into an empty bin. The bin floor is held stationary in a horizontal position by a hydraulic latch securing in a retracted position a hydraulic actuator connected between the floor structure and the bin frame. As the bin fills up, the weight of the collected lumber pulls against the counterweight to gradually drop the sling arm in a vertical arc until eventually it assumes a substantially horizontal position resting



against the tube member. When it is desired to empty a filled bin, the floor is allowed to start downward by the release of the latch on the actuator which in turn extends and allows the tube member to rotate about its axis, and pivot the floor downward, so as to form a bottom opening in the bin for gently depositing its contents onto a conveyor traveling underneath.

3,696,949

LOAD TRANSFER APPARATUS

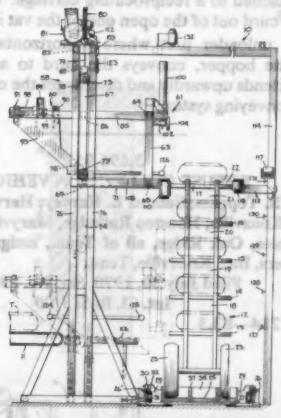
Jean Leblond, and Jean Biet, both of Compiegne, France, assignors to Uniroyal Englebert France S.A., Neuilly sur Seine, France

Filed July 16, 1970, Ser. No. 55,424

Claims priority, application France, July 21, 1969, 6924817

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A 13 Claims



An automatic apparatus is disclosed for transferring separate loads or objects individually from the conveying means bringing them to a loading station onto a truck or like vehicle which has a plurality of vertically spaced horizontal compartment tiers and by means of which the loads can be transported to another location for further handling or processing. The apparatus includes a load-hoisting lift movable vertically reciprocally past the various levels of compartments on such a truck in controlled amounts determined by the number and sizes of the horizontal tiers, a horizontal platform for supporting the truck and indexing it horizontally past the lift by increments determined by the number and sizes of

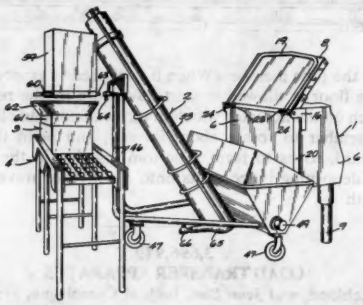
the objects to be disposed in side by side relation in each horizontal compartment, and means for transferring each load individually off the lift and into a respective compartment on the truck. This abstract is not to be taken as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,696,950

CHEESE MAKING APPARATUS

Norman J. Peters, Fond du Lac, Wis., assignor to Dairy Equipment Company, Madison, Wis.

Continuation-in-part of Ser. No. 669,572, Sept. 21, 1967, abandoned. This application Feb. 10, 1960, Ser. No. 871,441
Int. Cl. B65g 65/44
U.S. Cl. 214—17 D 15 Claims



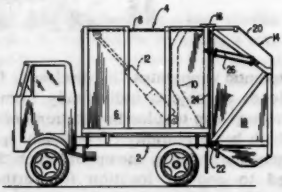
This invention relates to cheese making equipment including a vat to contain cheese curd, and a portable unloading unit for conveying the curd from the vat to an elevated location. The vat is provided with an open end which is enclosed by a hinged door and the cheese curd is removed from the vat by a blade attached to a reciprocating carriage. The blade acts to push the curd out of the open end of the vat into a hopper of a portable unloader unit where a horizontal auger, located within the hopper, conveys the curd to an inclined auger which extends upwardly and discharges the curd into hoops or onto a conveying system.

3,696,951

REFUSE COLLECTION VEHICLES

Charles R. Toppins; Samuel E. Harvey; Harvey W. Liberman, all of Knoxville; Houston Ratledge, Maryville, and Steven C. Voorhees, Oak Ridge, all of Tenn., assignors to Dempster Brothers, Inc., Knoxville, Tenn.

Filed July 30, 1970, Ser. No. 59,453
Int. Cl. B65f 3/00
U.S. Cl. 214—83.3 17 Claims



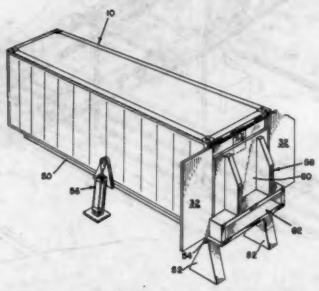
A rear loader for refuse collection vehicles. The rear loader includes a housing with an opening through which refuse is deposited in a hopper. A movable packer plate in the housing moves in opposition to the bottom of the hopper to partially compress the material and subsequently to convey the material through a discharge opening into the body of the vehicle. The packer plate in the housing also cooperates with an ejector plate in the body to further compress the refuse contained within the body.

3,696,952

BULK CARGO HANDLING SYSTEM AND METHOD

Bert A. Bodenheimer, Stamford, Conn., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Continuation-in-part of Ser. No. 21,966, March 23, 1970, abandoned. This application Oct. 26, 1970, Ser. No. 83,952
Int. Cl. B65g 65/34
U.S. Cl. 214—314 12 Claims



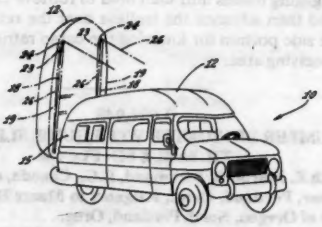
A system for transporting bulk cargo within conventional freight containers which includes a disposable container liner adapted to be positioned within a container or truck. The liner includes a flexible bag member having the open end or ends closed by bulkheads. Openings, which are normally sealed during transport of the container, are provided in the rear bulkheads for facilitating loading and unloading of the liner.

3,696,953

COMBINATION CAMPER VEHICLE AND BOAT

Sunyong P. Kim, 1350 W. Jefferson Boulevard, Apt. No. 1, Los Angeles, Calif.

Filed March 11, 1971, Ser. No. 123,337
Int. Cl. B60r 9/00
U.S. Cl. 214—450 10 Claims



Apparatus is disclosed for automatically loading and unloading a boat relative to the top of a camper vehicle. The apparatus provides a movable linkage mechanism adapted to be secured to the top of the vehicle. A pair of parallel arms connected to the gunwales of a boat is supported on the movable linkage mechanism. A spring means is provided for enabling the movable linkage mechanism to rotate the arms with the boat thereon in one direction, and a cable means is provided for enabling the movable linkage mechanism to rotate the arms with the boat thereon in the opposite direction. The movable linkage mechanism is effective in reducing the height of the swing of the boat being rotated through an arc of 180° between a rest position contingent to the ground in the back of the camper vehicle and an inverted rest position on the top of

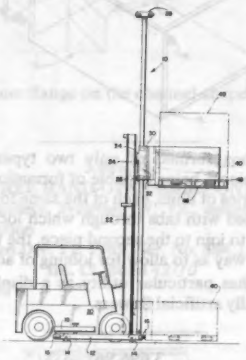
the vehicle, and is further effective in balancing the boat on the movable linkage mechanism during the swinging thereof such as to facilitate and minimize the power required to accomplish the movement.

3,696,954

SIDE LOADING STACKER

Alexander Weisker, Easton, and Raymond L. Smith, Jr., Southbury, both of Conn., assignors to C & M Manufacturing Company, Inc., Bethesda, Md.

Filed April 13, 1970, Ser. No. 27,728
Int. Cl. B66f 9/14
U.S. Cl. 214—731 17 Claims



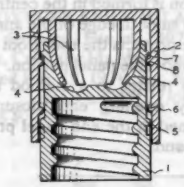
Forks are reciprocated through a carrier as the carrier moves laterally across a carriage. The carrier undergoes a motion similar to a storing or retrieving function. When no load is on the forks, the forks may be changed to serve racks to the right or the left of the stacker.

3,696,955

CONTAINER CLOSURE

Edmund Kundt, Obermumpf; Max Klaiber, Muttenz, Baselland, both of Switzerland; Wilfried Leitz, Muellheim, Baden, and Herbert Vom Rath, Neuenburg, Baden, both of Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 5, 1971, Ser. No. 113,018
Claims priority, application Switzerland, Feb. 13, 1970, 2134/70
Int. Cl. B65d 55/02
U.S. Cl. 215—9 12 Claims



A safety closure for containers is particularly intended to prevent young children unscrewing caps from bottles containing medicine or poison. The closure has a screw cap which screws on the container and a safety cap which surmounts the screw cap and rotation of which in a normal position does not apply significant torque to the screw cap. Springs located and acting between the caps to provide an axial thrust bias the caps apart to the normal position determined by limiting stops. The safety cap is axially pushed down against the springs to a position where rotational coupling means on the caps can be engaged and the screw cap rotated by rotation of the safety cap. The springs are in the form of arms or tongues fixed at one end to one of the caps or to a ring interposed between the caps. The spring arms bear on one or more cap surfaces to develop the required axial thrust. As the safety cap is axially pushed down each spring arm slides on the cooperating cap surface. The latter is made concave and preferably has a curvature which increases in the direction in which the spring arm slides as the screw cap is pushed down. This feature provides an increased axial thrust in a short axial displacement.

3,696,956

CONTAINER CLOSURE GASKET MADE FROM A NOVEL PLASTISOL COMPOSITION

Edward W. Merrill, Cambridge, and Jacob M. Pikarsky, Amherst, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 729,651, May 16, 1968, Pat. No. 3,563,936. This application Feb. 8, 1971, Ser. No. 113,188. The portion of the term of this patent subsequent to Feb. 16, 1988, has been disclaimed.
Int. Cl. B65d 53/00; C08f 45/38
U.S. Cl. 215—40 15 Claims

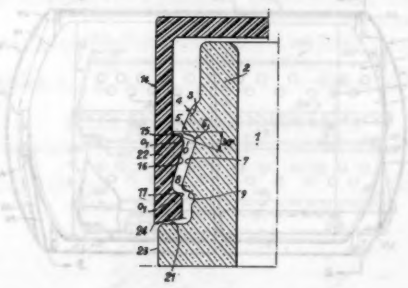
Container closure gaskets are molded from a plastisol composition containing as the resin component 10 to 50 parts by weight of dispersion grade vinyl chloride polymer and 50 to 90 parts by weight of mass-polymerized vinyl chloride polymer. The amount of plasticizer employed in the composition can range from 50 to 110 parts by weight per hundred parts by weight of the resin component.

3,696,957

FLUID-TIGHT, FLEXIBLE AND TAMPER-PROOF CAPS FOR CONTAINERS HAVING A MATCHING NECK PROFILE

Paul S. Van Baarn, Monte Carlo, Monaco, assignor to Captocap Limited, Vaduz, Liechtenstein

Filed Nov. 13, 1970, Ser. No. 89,377
Claims priority, application France, Nov. 19, 1969, 6939752
Int. Cl. B65d 41/22
U.S. Cl. 215—41 4 Claims

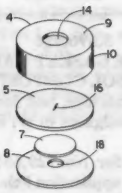


A fluid-tight and tamper-proof assembly comprising a container having a neck and a cap of elastomeric material, which cap comprises a top portion, and a skirt portion which engages around the neck, in which the outer surface of the neck is provided with at least two parallel collars and the inner surface of the skirt is provided with the same number of annular ribs as there are collars on the neck of the container, these ribs forming, with the inner surface of the skirt, grooves in which the collars engage resiliently when the cap is forced onto the neck characterized in that there are recesses formed under the collars on the neck to form a gap between each rib and the neck into which gaps the material of the ribs is forced when the cap is moved along the neck in a direction to remove the cap.

3,696,958
GAS VENTING LIQUID RETAINING CLOSURE

Hong Man Lee, Danbury, Conn., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio

Filed July 22, 1971, Ser. No. 165,216
Int. Cl. B65d *51/16*
U.S. Cl. 215—56 6 Claims

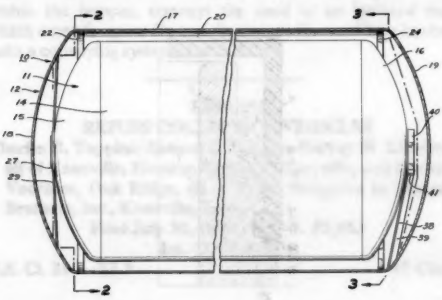


A container closure, e.g., a bottle cap, vents gases and/or vapors while retaining liquids. The closure has a liquid retaining diaphragm of film sandwiched tightly between a flexible venting disk and a support disk, all of which are held on the container by a cap body which may have threads, bayonet lugs, or the like. The venting disk has a slit which is blocked by the film. Gas to be vented travels past the film in a kind of labyrinth path, traveling radially outwardly to the edge of the film and then back on the other side of the film radially inwardly to where the slit is.

3,696,959
CRYOGENIC STORAGE VESSEL CONSTRUCTED OF DISSIMILAR MATERIALS

Paul J. Eifel, Walnut Creek, and Cesar E. Cavanna, Livermore, both of Calif., assignors to Lox Equipment Company, Livermore, Calif.

Filed Jan. 11, 1971, Ser. No. 105,413
Int. Cl. B65d *25/00*
U.S. Cl. 220—15 12 Claims

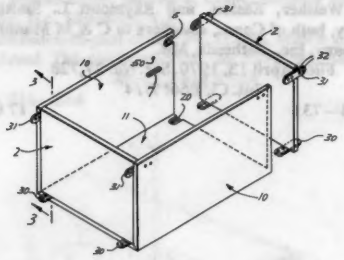


A vessel for storing and transporting cryogenic fluids such as liquid hydrogen, nitrogen and helium. The vessel comprises inner and outer elongated containers supported one within another in coaxial circumjacent relation by support means that includes transverse support structure adjacent each end of the vessel to constrain the containers against transverse or radial displacements relative to each other. The inner and outer containers are constructed of materials having different coefficients of thermal expansion; the inner container being formed of a material having a high coefficient such as aluminum and the outer container being formed of material having a lower coefficient such as steel. The transverse support structure includes elements comprised of each such material, and the invention is particularly concerned with a means for uniting the dissimilar materials at their junction adjacent the ends of the inner container.

3,696,960
MODULAR BOX

James M. Smirle, 309 Windsor Road, Wood-Ridge, N.J.

Filed Sept. 3, 1970, Ser. No. 69,276
Int. Cl. B65d *21/02, 11/18*
U.S. Cl. 220—23.4 5 Claims

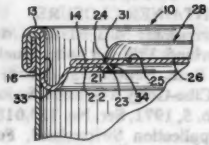


A modular box formed of only two types of pieces is described, the pieces being capable of formation into a single unit or into a series of units, each of the same form. One of the pieces is provided with tabs through which locking members can be inserted to join to the second piece, the tabs being provided in such a way as to allow for joining of additional members. The box has particular utility as a display vehicle for flowers, especially artificial flowers.

3,696,961
PROTECTIVE EDGE FOR EASY OPENING CONTAINER

Albert J. Holk, Jr., Frankfort, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 815,043, April 10, 1969, abandoned. This application Oct. 20, 1970, Ser. No. 82,260
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 6 Claims



An easy opening container in which the end closure is formed with annular fold bands. A weakening line to define a removable panel portion is formed in the central panel slightly outboard of the folded smooth edge of the annular fold bands so that the folded edge protects the user from the sharp edges after removal of the removable panel portion.

This disclosure also relates to a method for forming the above described easy opening end closure wherein the weakening line is formed in the end panel prior to complete formation of the fold band.

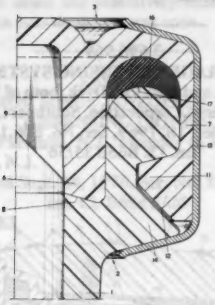
3,696,962
LIQUID SEALED CONTAINER

Hans Fehres, Essen, Belgium, and Lucas W. P. Boogert, Roosendaal, Netherlands, assignors to Van Leer (U.K.) Limited

Filed Dec. 10, 1970, Ser. No. 96,752
Claims priority, application Netherlands, Dec. 12, 1969, 6918704
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R 6 Claims

A container having a liquid tight lid retained by a locking ring with a resilient sealing member held within a channel-shaped profiled edge. To prevent undue compression of the

sealing member when other heavy articles are piled on top of a container, the inner periphery of the container has a recess en-



gaged by the inner flange on the channel-shaped profiled edge of the lid.

3,696,963

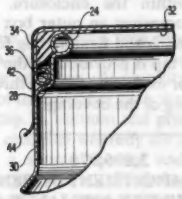
TOOL-FREE HAND-OPENABLE CONTAINER

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation

Filed Dec. 11, 1969, Ser. No. 884,134

Int. Cl. B65d *43/10*

U.S. Cl. 220—60 R **7 Claims**



Easy-open container structure with enlarged opening for direct consumption of beverages or substantially full-opening for removal of container contents, and without the disadvantages of tear-strip openings, is provided. A snap-on, reclosable, closure with predetermined contouring of the outer diameter of the closure and a portion of the container provides a co-extensive surface for effective operation of tape means which exert maximum strength for sealing purposes and minimum strength for removal purposes.

3,696,964

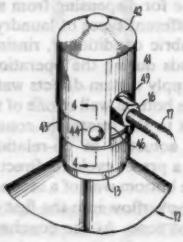
CAP FOR OXYGEN AND SIMILAR CONTAINERS

Alfred Deakin, deceased, late of 1307 Mount Pisgah Road, Walnut Creek, Calif. (by Ida Mae Deakin, administratrix)

Filed Feb. 19, 1970, Ser. No. 12,584

Int. Cl. G07f *11/00*

U.S. Cl. 220—85 P **11 Claims**



A cap for oxygen cylinders having an annular first portion threaded to the neck of the cylinder and a second portion telescopically engageable with the first portion and pivotally movable from a normal closed position in which the valve mechanism of the cylinder is enclosed to an open position wherein access is had to such valve mechanism.

3,696,965

CHILD'S LIQUID SPILL CONTAINER

Jack C. Napper, 3815 Volk Avenue, Long Beach, Calif.

Filed Jan. 15, 1971, Ser. No. 106,849

Int. Cl. A47g *19/22*

U.S. Cl. 220—90.4 **1 Claim**

A device for preventing a liquid dribbling from a child's chin while the child is drinking from a glass, the device comprising a container securable by means of a band to a side of the drinking vessel and into which the dribbling liquid drops, thereby not soiling the child's garment.

3,696,966

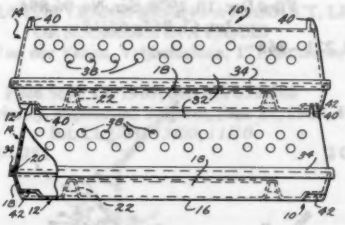
DEVICE FOR HANDLING BABY CHICKS AND THE LIKE

Ralph H. Herolzer, Cincinnati, Ohio, assignor to Vanguard Industries, Inc., Cincinnati, Ohio

Filed Jan. 22, 1971, Ser. No. 108,769

Int. Cl. B65d *21/04, 11/00*

U.S. Cl. 220—97 F **5 Claims**



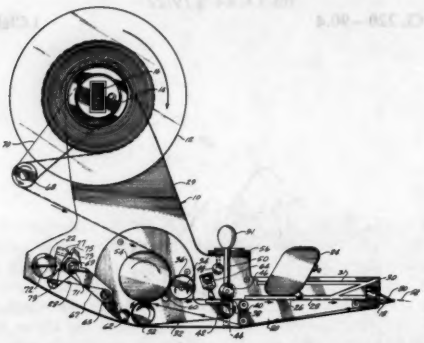
A device for handling baby chicks and the like consisting of two parts cooperable together to form a container serving to receive a multiplicity of baby chicks at the hatchery and to contain the chicks for unitary handling during transportation from the hatchery to the chicken house and subsequent positioning in supported relation on the floor of the chicken house, the top part being removable from the bottom part after the cooperating parts are positioned in the chicken house to liberate the chicks in supported relation on the bottom part, the latter providing means for receiving feed for sustaining the growth of the chicks for an initial period within the chicken house, the parts in cooperating relation providing stacking means for stably supporting a plurality of like cooperating parts in stacked relation during transportation, each part being freely nestable within like parts for convenient storage and return transportation.

3,696,967

LABEL DISPENSING SYSTEM

John R. Moore, Collegeville, Pa.; William L. Noack, Whittier, and Robert A. Roser, Claremont, both of Calif., assignors to Avery Products Corporation, San Marino, Calif.

Filed April 29, 1971, Ser. No. 138,689
Int. Cl. B65h 5/28
U.S. Cl. 221—73 24 Claims



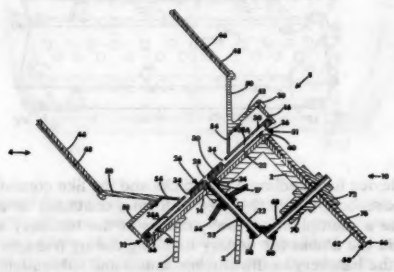
There is provided a system for accurately dispensing labels such as pressure sensitive labels from a carrier web having a release surface, on a continuous or synchronized basis. The system is based on a brake mechanism and a pressure roll pivoted about a common point, the former adapted to prevent transport of labels to a label dispensing element or mechanism and the latter for advancing a web or residue matrix by engagement with a constant running drum, upon release of the brake. Accurate dispensing of labels using the system is achieved through alternating brake-drive of the web or matrix in combination with the maintenance of a constant tension between the brake and rewind mechanism.

3,696,968

ARTICLE DEPOSITING MACHINE IMPROVEMENT

Merrell O. Jaech, Florisfant, Mo., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Dec. 10, 1970, Ser. No. 96,894
Int. Cl. B65g 65/18
U.S. Cl. 221—265 8 Claims



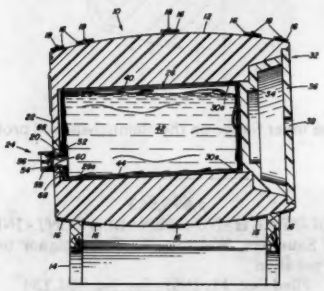
An improvement in the selector element of an article selector and depositing construction which selects articles from a mass and transfers them to a point of deposit. The improvement resides in the selector disc which is formed of a cooperatively engaged top and bottom plate, the top plate carrying a plurality of first spaced apart apertures disposed in a single ring concentrically to the center axis of the disc. The bottom plate defining an equal number of spaced apart second transfer apertures on its bottom surface and elongate depressions on its upper surface, the first and second apertures communicating with each other through said elongate depressions to form a plurality of radially disposed magazines for holding and transferring articles.

3,696,969

BEVERAGE DISPENSING SYSTEM

William T. De Van, and Ken Van Dyck, both of Weston, Conn., assignors to Auberge Corporation, Southport, Conn.

Filed Dec. 18, 1969, Ser. No. 886,114
Int. Cl. B65d 35/56
U.S. Cl. 222—105 4 Claims



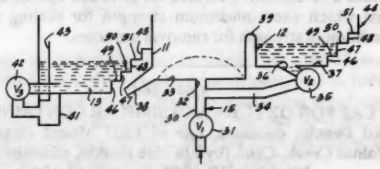
A beverage dispensing system comprising an enclosure in the form of a decorative wine cask, and a disposable beverage container for use within the enclosure. The disposable beverage container comprises an outer box also suitable for shelf display, and an enclosed flexible bag for containing the beverage. An integral tap is provided on the flexible bag, and means are provided for extending the tap through the box and enclosure for dispensing of the beverage.

3,696,970

MULTIPLE COMPARTMENT DISPENSER FOR A LAUNDRY APPLIANCE

Douglas E. Bunnell, Berrien Springs, and Douglas J. Walker, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed April 23, 1971, Ser. No. 136,956
Int. Cl. B67d 5/60
U.S. Cl. 222—145 8 Claims



A dispensing device adapted for use with an appliance such as a washing machine for dispensing from separate compartments at least two different types of laundry agents such as a detergent, bleach, fabric conditioner, rinsing additive or the like at distinct periods during the operation of the washing machine. A water supply system directs water through a first valve and through the bottom wall of one of the compartments to flush the contents to the treatment zone. A second valve may be selectively actuated in co-relation with the programmed periods of a preset cycle to direct water closely adjacent or through the bottom wall of a second compartment to float the contents by overflow into the first compartment and then to the treatment zone. At the conclusion of the operation, the diluted contents of both compartments readily empty through the bottom wall openings and minimize the accumulation of any residue of the agent or additives in the plumbing or

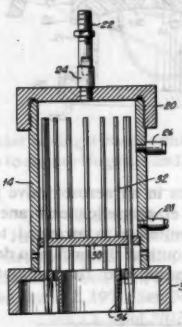
conduit system. In one embodiment a third compartment is associated with the first two compartments and has a separate valve controlled drain for selectively draining the contents contained therein into the treatment zone.

3,696,971

MECHANISM FOR SIMULTANEOUSLY METERING AND DISPENSING LIQUIDS

Ernest Maclin, Paramus, N.J., assignor to Electro-Nucleonics, Essex County, N.J.

Filed Sept. 24, 1970, Ser. No. 75,109
Int. Cl. B65d *5/06*
U.S. Cl. 222—183 3 Claims



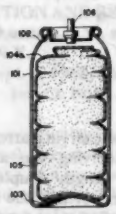
A multiple liquid dispensing type pipette apparatus has a chamber having a body closed at the top by a cap and at its bottom by a base member. A plurality of pipettes extend through the base of the chamber such that their inner ends are spaced from the cap. A vacuum and pressure connection extends through the chamber whereby the pipettes may be filled with liquid from a source thereof under the influence of vacuum. After the pipettes are filled they may be discharged by venting the chamber to atmosphere and then purged by putting the dispensing chamber under air pressure. A liquid drain extends through the body of the chamber at a point not substantially above its base plate.

3,696,972

GAS FLOW DISPENSER BAG

Fleix Rousselot, Liguge, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed March 12, 1970, Ser. No. 18,957
Claims priority, application France, March 14, 1969, 6907343
Int. Cl. B67d *5/58*
U.S. Cl. 222—189 5 Claims



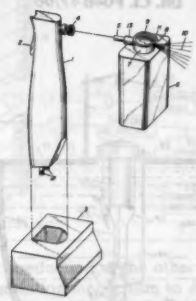
A dispenser for dispensing a stream of gas includes a lacunary mass which holds the liquefied gas. The mass is enclosed in a bag which is impermeable to the mass, but is permeable to the liquid and to the gas resulting from vaporization of the liquid.

3,696,973

HAND-HELD AIR COMPRESSOR AND LIQUID SPRAY DEVICE

Eric C. Cottell, Windermere, Bayville, L.I., N.Y.

Filed Dec. 9, 1969, Ser. No. 883,562
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 6 Claims



A hand-held air compressor having motor air pump and air discharge fitting which mates with a male fitting on a disposable plastic container for liquid to be sprayed, the top of the container having a movable inner plug containing a smooth plastic jet, which in one position aligns a conduit from the male fitting to the jet and also connects with a conduit extending to near the bottom of the container, permits spraying of the liquid, such as a hair spray, when connected with a plug in the position described. When the plug is turned through an angle, connection from the male fitting is sealed off and the jet is moved so that it is no longer opposite an opening in the top of the container. This seals off the container. Adjacent the jet is an air passage down into the container, half of which is indented into the plug and the other half of which is indented into the wall of the hole so that when the air jet passage is in line, this air passage is in line also. It is also sealed off when the plug is turned. The air compressor has charging contacts which fit into a conventional battery charger when the spray device is no longer in use.

3,696,974

APPARATUS FOR TRANSFERRING A PRODUCT, LIQUID OR SUCHLIKE IN A LIQUID

Germaine Van der Veken, Vrijheidslaan, 171, Brussels, Belgium

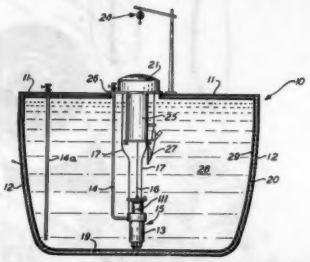
Filed Sept. 19, 1969, Ser. No. 859,308
Claims priority, application Belgium, June 27, 1969, 49257
Int. Cl. G01f *13/00, 11/10*
U.S. Cl. 222—251 2 Claims

Apparatus for transferring a product, liquid or suchlike into another liquid, comprising the combination of an outer and of an inner element, whereby one of these elements is provided at one extremity with at least one cavity, the capacity of which corresponds to the dose of product or liquid to be handled.

3,696,975
SUBMERGED PUMP REMOVAL SYSTEM

Gerald T. Bryant; Hans D. Linhardt, both of Costa Mesa, Calif., and Kenneth E. Nichols, Denver, Colo., assignors to Airco, Inc., New York, N.Y.

Continuation of Ser. No. 776,946, Nov. 19, 1968, abandoned. This application July 13, 1970, Ser. No. 56,190
Int. Cl. F04b 47/06
U.S. Cl. 222—333 22 Claims

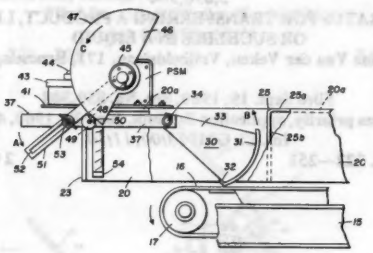


This invention relates to a submerged pump system for a tank, comprising a discharge housing in the bottom of the tank, means to lower a pump into said housing and to raise said pump into a chamber in the top of the tank, valve means to seal said chamber from the tank after the pump has been lifted into the chamber, said valve means thereby sealing the tank from theatmosphere and allowing the pump to be safely removed from the chamber.

3,696,976
LINEARIZED GATE CONTROL SYSTEM FOR MULTIPLE FEEDER AND HOPPER ARRANGEMENTS

Wayne B. Jacobson, Cedar Rapids, Iowa, assignor to Iowa Manufacturing Company, Cedar Rapids, Iowa

Division of Ser. No. 793,962, Jan. 27, 1969, Pat. No. 3,581,947. This application June 17, 1970, Ser. No. 57,885
Int. Cl. B67d 5/60
U.S. Cl. 222—504 5 Claims

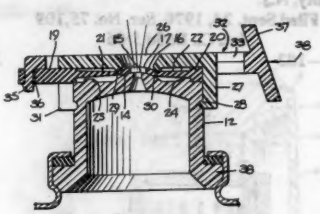


A linearized gate control for multiple hopper-feeders of the cold feed system of an asphalt plant is disclosed. Each hopper includes a cam, driven by a position servo motor, which opens or closes the gate governing the flow of aggregate from the hopper to its feeder, the latter being driven at a constant speed. The cam is profiled so that equal increments of motor shaft rotation produce equal increments of gate opening. The servo motors of all hoppers are connected into an electrical bridge circuit such that, after the respective proportionate openings of the gates are initially established by the setting of individual electrical controls for the gate motors, adjustment of a single master control to produce a certain percentage increase or decrease in the total aggregate delivered from all the hoppers will also increase or decrease the opening of each gate by the same percentage, as the case may be.

3,696,977
STRETCH ELASTOMER VALVE

Richard L. Davenport, and Gerald M. Niemiec, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed April 21, 1971, Ser. No. 135,955
Int. Cl. B65d 47/20
U.S. Cl. 222—561 8 Claims

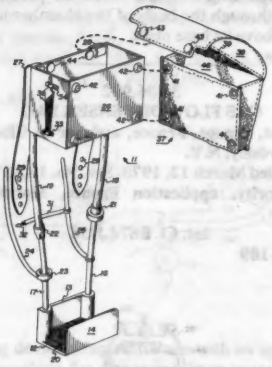


The discharge orifice in an aerosol valve is controlled by means of a stretchable elastomeric membrane having an aperture therein. The membrane is arranged to be selectably stretched across the mouth of the orifice to draw the aperture into and out of registration with the orifice thereby opening and closing the valve.

3,696,978
ADJUSTABLE QUIVER

Gerald F. Gentellalli, 8817 La Mesa Boulevard, La Mesa, Calif.

Filed May 11, 1970, Ser. No. 36,074
Int. Cl. F41b 5/06
U.S. Cl. 224—1 B 1 Claim



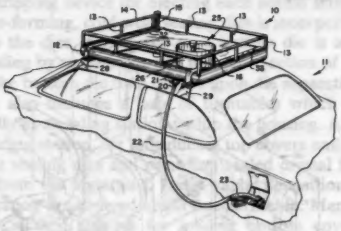
An adjustable quiver for carrying arrows having a bottom platform adapted for receiving the arrow points and a framework adjustable in length coupled to a rectangular cylinder above the bottom portion, the arrows being loaded through the rectangular cylinder, and a flexible cover having one end attached to one wall of the guide cylinder and another end attached to an opposite wall of the guide cylinder for covering the top of the guide cylinder and compressing arrows therein between the bottom surface of the cover and the bottom platform; the cover having a pouch therein for carrying various archery accessories or supplies, and a pair of carrying brackets for carrying a sharpening file therein.

3,696,979

CAR TOP CARRIER

Keith Duane Erickson, 3727 South 900 East, Salt Lake City, Utah

Filed April 28, 1971, Ser. No. 138,060
Int. Cl. B60r 9/04
U.S. Cl. 244—42.1 E 4 Claims



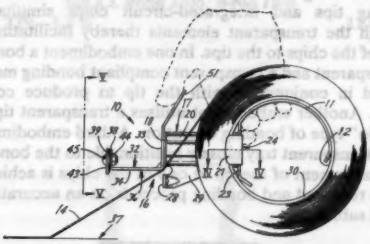
A car top carrier having a base forming a gas or water tank and a walled top to support luggage and the like.

3,696,980

HAND-HELD DISPENSER

Edward Waltz, Grand Rapids, Mich., assignor to The E. O. Bulman Manufacturing Co., Inc., Grand Rapids, Mich.

Filed June 22, 1970, Ser. No. 48,402
Int. Cl. B26f 3/02
U.S. Cl. 225—66 3 Claims



A portable, hand-held dispenser having a substantially semi-cylindrical member, upon which a roll of tape is mounted, and support structure extending outwardly from said member. Resiliently biased stop means is mounted on said member for releasably holding the roll of tape on the member, and a cutting edge on the outer end of the support structure is engageable by the strip of tape. A guide element and thumb engaging flange are also provided on the supporting structure.

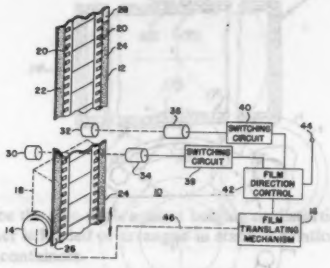
3,696,981

FILM POSITION AND BREAK DETECTOR

Kenneth Levy, Binghamton, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Sept. 5, 1968, Ser. No. 757,714
Int. Cl. B65h 25/10
U.S. Cl. 226—11 6 Claims

The disclosed exemplification of the present invention is a film position and break detector for use with a motion picture projector and the like. An opaque magnetic material in the form of a strip extends along each longitudinal edge of the film and preferably contains information relating to film speed. A portion of one strip is removed at the beginning end of the film and a portion of the other strip is removed at the finish end of the film leaving transparent portions of the film exposed. A pair of light sources are mounted on one side of the prescribed path of film travel and are positioned to illuminate a respective magnetic strip. A pair of light sensing diodes are mounted on the opposite side of the prescribed path of film travel and are positioned to be illuminated from a corresponding light source in the absence of any magnetic strip interposed therebetween. A circuit is responsive to the conduction of one light sensing diode to actuate the film translating mechanism of the projector to drive the film in one direction and is



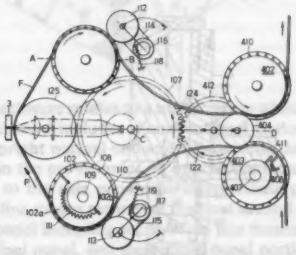
responsive to the conduction of the other light sensing diode to actuate the translating mechanism to drive the film in the opposite direction. The circuit is further responsive to the conduction of both light sensing diodes to de-energize the film translating mechanism.

3,696,982

FILM-DRIVING ROLLER WITH DEVICE FOR STOPPING THE DRIVE MECHANISM IF THE FILM IS OVERLOADED

Gernot Gottschall, Boblingen, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Filed Dec. 2, 1970, Ser. No. 94,457
Claims priority, application Germany, Jan. 8, 1970, P 20 00 612.6
Int. Cl. B65h 25/00
U.S. Cl. 226—25 8 Claims



In an optical-electronic scanning device wherein a control film is passed by film driving means and a film cassette, a means for reacting to excessive tension or pull which stops the driving means when a preselected tension is exceeded on the film.

3,696,983

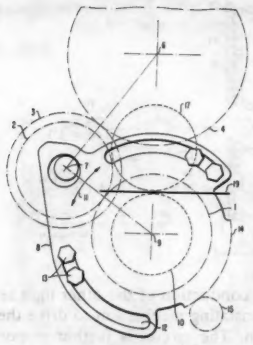
ROLL FEED FOR STRIP- OR BAND-SHAPED WORKPIECES, ESPECIALLY AT QUICK-MOTION PRESSES

Ewald Bergmann, Goppingen, and Alfred Bareis, Uhingen, both of Germany, assignors to L. Schuler GmbH, Goeppingen, Germany

Filed March 20, 1970, Ser. No. 21,338
Claims priority, application Germany, March 22, 1969, P 19 14 773.0
Int. Cl. B65h 17/22
U.S. Cl. 226—141 25 Claims

A roll feed for strip- or band-shaped workpieces, particularly for quick-motion presses, comprising two cooperating

rolls and an intermittent feed motion being imparted to one of the rolls by an intermittent drive means via gears. The gears are exchangeable in order to obtain different feed lengths. The gears include a first gear coaxially arranged with the drive roll



and connected with the driven roll for rotation therewith, a second gear meshing with the first gear and coaxially arranged with and connected to a third gear for rotation therewith, and a fourth gear meshing with the third gear and driven by the intermittent drive means.

3,696,984

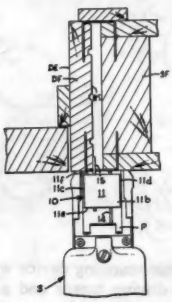
STAPLER ADAPTER FOR INSTALLING DOORS

Peter F. Fitchen, 19294 DeHavilland Drive, Saratoga, Calif.

Filed June 28, 1971, Ser. No. 157,477

Int. Cl. B25c 7/00

U.S. Cl. 227—110 **7 Claims**



A stapler adapter mounted on the face plate of a conventional pneumatic stapler for guiding the ejection of the stapler so that one leg of the staple penetrates the structural frame and the other leg of the staple penetrates the door frame. For accurately locating the legs of the staple with respect to the area of penetration of the structural frame and the area of penetration of the door frame, guide members are optionally and selectively employed to engage the back edge of the door frame either from the right-hand or left-hand working position. The stapler adapter of the present invention includes a first guide member and second guide member that are respectively movable between a retracted position and an extended position for optional and selective use depended on whether the selected guide member is to engage the door frame either from the right-hand or left-hand working position.

3,696,985

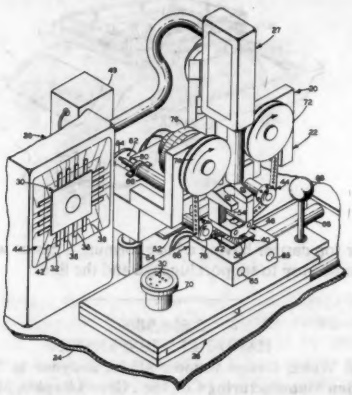
METHODS OF AND APPARATUS FOR ALIGNING AND BONDING WORKPIECES

Carl R. Herring, Allentown, and Fred J. Schneider, Catassauqua, both of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,447

Int. Cl. B23k 1/00

U.S. Cl. 228—4 **20 Claims**



Bonding machines have transparent elements on their bonding axes. Magnified optical means are positioned to view bonding tips and integrated-circuit chips simultaneously through the transparent elements thereby facilitating alignment of the chips to the tips. In one embodiment a bonding tip is transparent and a transparent compliant bonding member is utilized in conjunction with the tip to produce compliant bonds. Another embodiment utilizes a transparent tip in a "hard tip" type of bonding operation. A third embodiment utilizes a transparent tray closely positionable to the bonding tip. After alignment of the tip to one of the chips is achieved the tray is removed and bonding proceeds on an accurately positioned substrate.

3,696,986

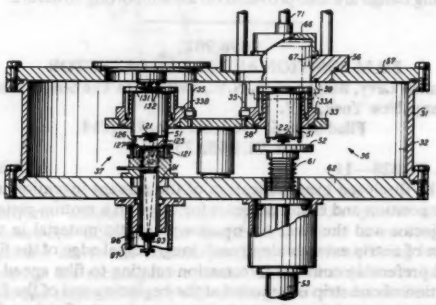
APPARATUS FOR PRODUCING A SEALED ARTICLE

Albin R. Anderson, Lowell; John D. Jennings, Andover, and Walter E. Killerby, Lowell, all of Mass., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 80,093

Int. Cl. B23k 21/00; B23p 3/02

U.S. Cl. 228—3 **5 Claims**



Sealed piezoelectric crystal devices with desired frequency response characteristics are manufactured by treating and sealing each crystal in a vacuum environment within a common apparatus housing. Vapor deposition treatment is util-

ized, with treating material replenishing mechanisms being positioned within the vacuum environment in order to avoid disturbing the vacuum environment during replenishing operations. Sealing is performed by cold weld sealing a pair of covers about each treated crystal device. The arrangement is designed to minimize alterations in the crystal frequency response characteristics subsequent to the vapor deposition treatment.

A die stripping device for ejecting each sealed article from two article-forming, cold weld sealing dies is incorporated entirely into the dies. An ejector on a bottom die is activated during sealing by an actuator of a top die. Ejection of the article from the bottom die then occurs upon die separation. The apparatus also includes a pair of turntables which overlap peripherally at a sealing station within the housing. A loading and unloading station, for introducing top covers and crystals into upper sealing dies and removing sealed crystal filter assemblies from the apparatus, and a vapor deposition crystal treating station are arrayed about one turntable. Manual and automatic loading stations for loading bottom covers into lower sealing dies are arrayed about the other turntable. Also included in the apparatus are various loading and unloading mechanisms and associated air-lock arrangements at the different stations.

3,696,987

COATED CUP AND METHOD OF MANUFACTURE

Richard William Schuff, Phoenix, and Edson Sheppard Harris, Jr., Scottsdale, both of Ariz., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Feb. 26, 1971, Ser. No. 119,162
Int. Cl. B65d *3/06*; B44d *1/08*
U.S. Cl. 229—1.5 B **12 Claims**

An improved package comprising an expanded plastic bead container preferably of styrene and a coating on the container comprising a saran latex material set in direct contact with the expanded plastic bead container. The improved package of the invention provides a vapor and liquid barrier and restricts the entrance of oxygen and other gases to the package as well as providing greater insulation capacity.

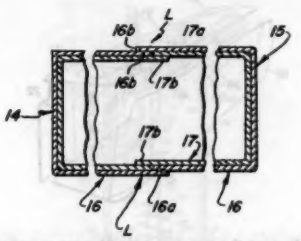
3,696,988

CONTAINER CONSTRUCTION

Terrill L. Nederveld, Neffsville, Pa., assignor to Packaging Corporation of America, Evanston, Ill.

Filed July 6, 1971, Ser. No. 159,822
Int. Cl. B65d *19/06*, *13/06*
U.S. Cl. 229—23 R **10 Claims**

A heavy duty container is provided which is adapted for use in the bulk packaging of siftable material or the like. The container is formed from a pair of complemental sections which cooperate to form end walls and elongated side walls. Each side wall is provided with a lap joint disposed intermediate the end walls. The lap joints are of multi-ply construction and



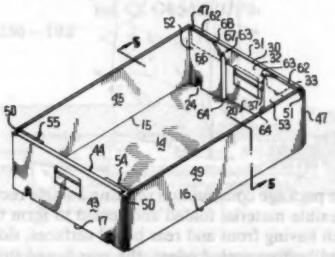
reinforce the side walls against bulging or distortion when the container is loaded or arranged in stacked relation with other loaded containers.

3,696,989

CARTON HAVING NOVEL INTERLOCKED CORNER CONSTRUCTIONS

John W. Kochevar, Downers Grove, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,071
Int. Cl. B65d *5/22*
U.S. Cl. 229—34 **14 Claims**



This disclosure relates to a novel carton which at each of the corners thereof includes a conventional bottom panel and a pair of upright normal end and side panels, the improvement residing in the provision of an intermediate panel joined by a fold line to the side panel, the intermediate panel including first fold line means setting off first and second panel portions, the end panel including second fold line means beyond which is a terminal panel, and the second panel portion and the terminal panel being folded about the respective first and second fold line means in such a manner as to at least partially sandwich the terminal panel between the first and second panel portions thereby interlocking the panels together and reinforcing the same at each corner. More particularly the terminal and intermediate panels are provided with notches which facilitate the folding of the terminal and intermediate panels from planar form to the set-up condition of the carton.

3,696,990

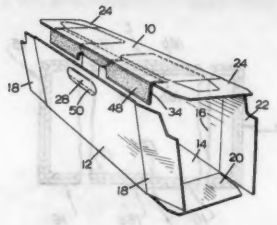
PAPERBOARD CONTAINER

Ernest James Dewhurst, Toronto, Ontario, Canada, assignor to Somerville Industries Limited, London, England

Filed Nov. 5, 1970, Ser. No. 87,185
Int. Cl. B65d *5/16*
U.S. Cl. 229—37 R **7 Claims**

The invention relates to an end-loading container for consumer products, such as beer, and a principal feature of the container is the provision of a bridging arrangement across the top wall that gives strength to the container as it is lifted by

means of a hand opening formed in a side wall opposite the bridge. A further feature of the container is the reinforcement



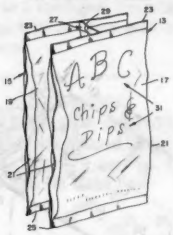
of the area adjacent the hand opening by means of added plies of paperboard folded from the container blank.

3,696,991

DOUBLE PACKAGE

William F. Willis, 174a Addison Road, Palos Verdes Estates, Calif.

Filed Nov. 30, 1971, Ser. No. 203,318
Int. Cl. B65d *31/00*
U.S. Cl. 229—53 **6 Claims**



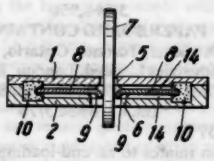
A double package construction utilizing a single rectangular sheet of flexible material folded and sealed to form two containers each having front and rear broad surfaces, side edges, and top and bottom sealed edges, the rear broad surfaces of the packages being joined by a web portion midway between their side edges, the web portion including perforations along its length to facilitate the separation of the packages without disturbing any indicia disposed on their front broad surfaces.

3,696,992

SAVINGS BANK INSERTION SLOT SAFETY MECHANISM

Heinz Krone, Asperg, and Wilhelm Hoffmann, Ludwigsburg, both of Germany, assignors to Krone G.m.b.H., Ludwigsburg/Wurttemberg, Welt, Germany

Filed Dec. 4, 1970, Ser. No. 95,072
Claims priority, application Germany, Dec. 4, 1969, P 19 60 978.0
Int. Cl. A47g *29/00*
U.S. Cl. 232—4 **7 Claims**



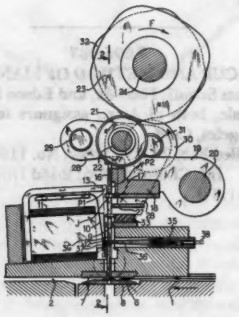
Savings bank insertion slot safety mechanism with several locking clasps situated on the inside of the insertion slot and movable against one another and held in a locking position by means of spring tension, the front ends of the locking clasps entering, in the locked position, into the slot up to the middle of the insertion slot and being pressed into released position when a coin is inserted in the slot in which the locking clasps are guided independently of one another and transversely to the insertion slot, the front ends of the locking clasps are tilted downward, and the locking clasps rest with their rear ends each on a common spring element arranged on the corresponding side.

3,696,993

APPARATUS FOR PUNCHING RECORD CARDS OR TAPES

Jacques Roland DeProux, Sevres, France, assignor to Societe Industrielle Honeywell Bull, Paris, France

Continuation of Ser. No. 861,813, Sept. 29, 1969, abandoned. This application April 9, 1971, Ser. No. 132,828
Claims priority, application France, Oct. 23, 1968, 68171013
Int. Cl. G06k *1/05*
U.S. Cl. 234—118 **15 Claims**



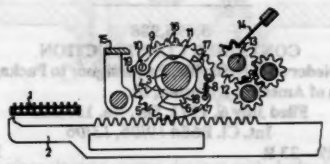
A cyclically operating punching apparatus in which each punch of a row can occupy an inactive position in which it is maintained by an electromagnet when the latter is energized, or an active position into which it is pushed by a spring when the electromagnet is not energized and in which it is subjected to the action of actuating members for performing a punching operation, whereafter it is returned by a return bar into the inactive position in which it is or is not maintained, depending upon whether the electromagnet is energized.

3,696,994

CALCULATING MECHANISM FOR TEN KEYS - FOUR SPECIES - CALCULATING MACHINES

Gottfried Burkhardt, Winkelhaid, Germany, assignor to Diehl, Nurnberg, Germany

Filed July 19, 1971, Ser. No. 163,944
Claims priority, application Germany, Aug. 1, 1970, P 20 38 370.4
Int. Cl. G06c *15/12, 27/00*
U.S. Cl. 235—60 R **4 Claims**



The specification discloses a calculating mechanism for transferring values from a value detecting rack to a counter

gear in which a setting disc has teeth meshing with the rack and a peripheral cam with a sharp rise at one end. A control wheel which rotates on each machine cycle has a toothed sector pivotally mounted thereon and biased away from engagement with the counter gear. The sector has a cam on the inner side in the plane of the cam on the setting disc with a sharp rise at the leading end. The cams move the sector into engagement with the counter gear when the rises meet so the adjusted position of the disc determines the amount of rotation imparted to the counter gear when the control wheel makes a rotation.

3,696,995

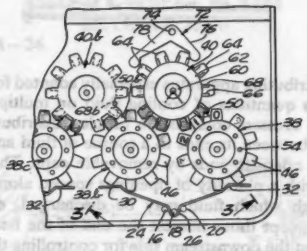
CALCULATOR

William Kasner, 1330 Hollydale, Fullerton, Calif.

Continuation-in-part of Ser. No. 94,222, Dec. 2, 1970. This application Sept. 27, 1971, Ser. No. 184,151

Int. Cl. G06c 7/10, 15/26

U.S. Cl. 235—139 R **8 Claims**



A calculator of the type with successive digit or numeral wheels with improved carryover or transfer means between wheels. Transfer wheels are used between successive digit or numeral wheels. Each digit wheel has a finger or projection which picks up abutments on a transfer wheel for driving it and effecting the transfer or step movement. The transfer wheel has spaced abutments which are picked up by the projection on the digit or numeral wheel. These abutments on each transfer wheel are displaced angularly from ten predetermined stopping positions of the transfer wheel. When there are simultaneous transfers or carryovers of several digit wheels, there is a slight delay in the pick up of each transfer wheel for effecting the transfer with the result that the transfer takes place sequentially thereby eliminating the imposition of a sudden, heavy torque load on a single driving digit wheel.

3,696,996

WATER THERAPY SAFETY CONTROLS

Harold B. Lloyd, 2037 South Cedar Street, Sioux City, Iowa, and Sterling E. Stewart, 523 E. 19th Street, South Sioux City, Nebr.

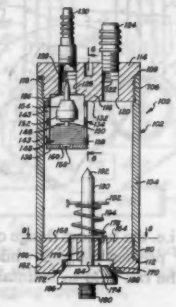
Filed Jan. 27, 1971, Ser. No. 110,039

Int. Cl. G05d 23/12

U.S. Cl. 236—92 **7 Claims**

A first form of water therapy safety control to discontinue the flow of liquid to a therapy device responsive to increase in temperature of the liquid over a predetermined limit has a receptacle with a strut at a mid-depth location. A thermally actuated bellows operator is mounted on the strut and carries a rod with a closure which is placed in shut-off position by expansion of the bellows. The receptacle has a member adapted to open upon increase of pressure therewithin;

In a second form of the invention, a receptacle has liquid inlet and outlet openings, the outlet being provided with a thermal operator which closes the outlet in response to increased temperature of the liquid past a predetermined limit.



A normally closed discharge opening has a spring biased closure which opens responsive to pressurization of the receptacle upon closing of the outlet.

3,696,997

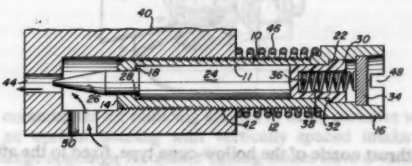
VALVE REPSONSIVE TO TEMPERATURE CHANGES OVER A LIMITED RANGE

Robert T. Gifford, Yellow Springs, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed April 9, 1971, Ser. No. 132,666

Int. Cl. G05d 23/275

U.S. Cl. 236—102 **14 Claims**



A fluid flow metering valve which varies effective flow area in response to temperature changes over a limited temperature range. The valve core, having a conically shaped end positioned in the fluid flow port, expands freely as temperature increases to a predetermined value from a temperature below that value. Thereafter, an abutment in the valve casing is engaged by a shoulder on the valve core to prevent the conically shaped end of the core from advancing further into the port, with additional expansion of the core being accommodated at the opposite end of the casing. A spring retains the core in the casing and returns it to its original position upon a decrease in temperature to and below the predetermined value.

3,696,998

DEVICE FOR HOLDING DOWN THE RAIL TO THE SLEEPER IN A RAILWAY TRACK

Padinjarai-Madom Narayanan Nair Bhaskaran Nair, Research Designs & Standards Organization, Lucknow, India

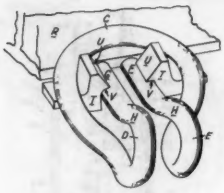
Filed Dec. 9, 1970, Ser. No. 96,435

Int. Cl. E01b 9/48

U.S. Cl. 238—349 **3 Claims**

The improved device consists of an elastic fastening made of spring steel rod. The rod is bent to form a loop portion which rides over and sits on the bottom flange of the rail. The two ends of the loop are bent downwardly thus providing humps. Then the ends of the same rod after bending downwardly are shaped each into a coil. The ends of the coil then project towards the loop and lie within the loop. These projections form legs. This elastic fastening is secured to the

sleeper by a securing device such that the loop rides and sits on the bottom flange of the rail. The legs are forced down by the securing device such that the ends of the legs bear against



the edge of the foot, i.e. the bottom flange of the rail. The loop thus holds down or presses the rail while the legs bearing against the foot of the rail help to maintain the gauge of the rail.

3,696,999

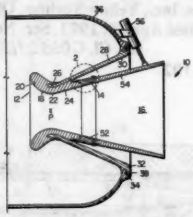
MOVABLE THRUST NOZZLE FOR ROCKETS

Stanley P. Desjardins, Brigham City; Alan R. Canfield, North Ogden, and Jonathan W. Wilson, Brigham City, all of Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed July 17, 1967, Ser. No. 653,764

Int. Cl. B64c *15/04*

U.S. Cl. 239—265.35 **3 Claims**



A thrust nozzle of the hollow-cone type, fixed to the aft closure of the rocket. An annular portion of the divergent cone being constructed of rigid laminae bonded to interposed layers of elastomer functions not only as a part of the expansion surface of the nozzle but also as a flexible bearing to permit lateral movement of the rigid portion of the divergent cone downstream therefrom.

3,697,000

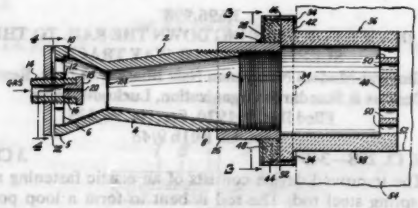
GAS BURNER FOR FURNACES, KILNS, AND THE LIKE

Dudley F. Giberson, Jr., Box 202 Joppa Road, Warner, N.H.

Filed April 1, 1970, Ser. No. 24,727

Int. Cl. B05b *7/12*

U.S. Cl. 239—407 **10 Claims**



A gas burner for use with kilns, furnaces, and the like, having a tubular body with a venturi throat. A ceramic burner head of high-heat resistent material is mounted on one end of the body. A regulated volume of air, and gas are admitted at the opposite end. A gas supply orifice is adjustable relative to the venturi throat. The burner head is cup-shaped and provides a mixing chamber for the air and gas. The mixture discharges through a series of passageways in the head to form separate high-heat flames. The burner head is aligned and carried by a coupling that is detachable from the body. A refractory seal is formed between the coupling and the adjacent end of the burner head.

3,697,001

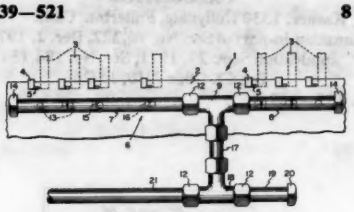
FLUID DISTRIBUTING APPARATUS

Clifford A. Skodak, 11747 Brady, Chesaning, Mich.

Filed Dec. 9, 1970, Ser. No. 96,470

Int. Cl. B05b *1/26*

U.S. Cl. 239—521 **8 Claims**



Fluid distributing apparatus especially adapted for discharging copious quantities of cooling fluid on multiple grinding wheels and dressers comprises a tubular, distributing header connected between its ends to a source of fluid and closed at each of its opposite ends by removable caps. The header is provided with a plurality of openings spaced along its length and through which fluid may be discharged, each of the openings except those nearest the end of the header having deflectors at the downstream side for controlling the direction of fluid discharged therethrough. The header is adjustable about its own axis to any one of a number of selected positions.

3,697,002

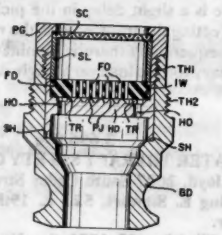
FLOW CONTROL DEVICE

Richard G. Parkison, Somerville, N.J., assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 24,248, March 31, 1970, Pat. No. 3,630,455. This application July 21, 1971, Ser. No. 164,727

Int. Cl. B05b *1/30*

U.S. Cl. 239—535 **15 Claims**



Covers a fluid flow device or pressure regulator suitable for a spout-end structure for a plumbing fitting or fixture. The equipment includes two tandem arranged disk structures to be inserted in the spout-end to control the flow through the spout-end. The upstream element comprises a substantially flat cylindrical flexible disk having a plurality of substantially identical cylindrical parallel apertures. The downstream element comprises a hard metallic or plastic disk having a plurality of hard substantially non-flexible projections which may be located in the central region of the disk, a plurality of parallel

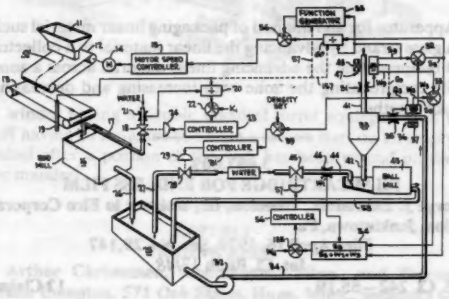
substantially identical apertures which are peripherally arranged about the projections of the disk and a plurality of supports or barriers near the several projections. The two disks are positioned closely adjacent or contiguous to each other so that, in the absence of fluid pressure or under low fluid pressure conditions, the hard or non-flexible projections on the hard or lower disk barely contact the adjacent surface of the upstream or upper flexible disk. As the fluid pressure reaches a predetermined value or exceeds the predetermined value, the projections on the second or hard disk will remain rigid and unchanged in shape, but the upper flexible disk will be compressed so that the overall area of the apertures of the first disk through which fluid flows will be reduced so that the fluid flow through the two disks will remain substantially unchanged, notwithstanding changes in the pressure of the applied fluid however rapid or however slow.

3,697,003

GRINDING MILL METHOD AND APPARATUS

Michael P. Grant, Columbus, and Edward J. Freeh, Worthington, both of Ohio, assignors to Industrial Nucleonics Corporation

Filed Feb. 4, 1970, Ser. No. 8,661
Int. Cl. B02c *25/00*
U.S. Cl. 241—24 **14 Claims**



Rate of input ore fed to a grinding mill, including a hydrocyclone particle classifier in a recirculating loop, is controlled to maintain a predetermined relation between particle size and production rate. From the actual production rate and the predetermined relationship a value for the ratio of recycled solid feed rate to output or input solids feed rate is determined. The determined ratio value is compared with the actual ratio value derived from measurements to control input ore feed rate. The consistency of slurries fed to each of a rod mill, ball mill and the classifier is maintained constant.

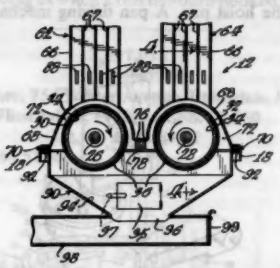
3,697,004

METHOD AND APPARATUS FOR GRANULATING WAX

Joseph H. Lazar, 530 Green Bay Road, Highland Park, Ill.

Filed June 23, 1971, Ser. No. 155,761
Int. Cl. B02c *13/00*
U.S. Cl. 241—27 **11 Claims**

Multiple sets of blocks of solid wax which is a byproduct of the distillation of crude oil into gasolene and other useful direct products are vertically supported over a pair of oppositely rotating spirally wound wire brushes about twelve inches in diameter having stiff bristles of high tensile steel wire about 1 inch long. The sets of blocks are enclosed within feeders rockably positioned over the brushes and mounted on hemispherically shaped enclosures for the upper portions of the brushes. The brushes and feeders are mounted on an open frame which also supports a separate driving motor for each brush. Below the brushes is a hopper shaped accumulator, the



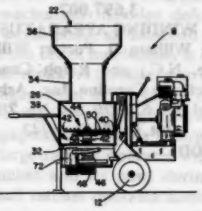
outlet of which opens into a 6 inch pipe connected to a suction blower which feeds directly to the process or product using the waxes or to a bagging apparatus.

3,697,005

APPARATUS FOR COMMINUTING ARTICLES

Andrew P. Lundin, 323 Covington Road, and John D. Milner, 11945 Country Club Drive, both of Los Altos, Calif.

Filed May 3, 1971, Ser. No. 139,488
Int. Cl. B02c *21/02*
U.S. Cl. 241—101 M **15 Claims**



A comminuter for reducing articles to small particles which has an upright housing with vertically spaced intake and discharge openings. Rotatable cutting blades have a vertically downwardly extending housing floor scraper with off-set scraper teeth on at least a pair of blades and upwardly extending splitting wedges. The blades are rotatably mounted within the housing and actuated by a hydraulic motor. A hydraulic pump powered by an internal combustion engine or the like is coupled with the hydraulic motor via a valve that permits the reversal of the direction of rotation of the motor and cessation of its rotation.

3,697,006

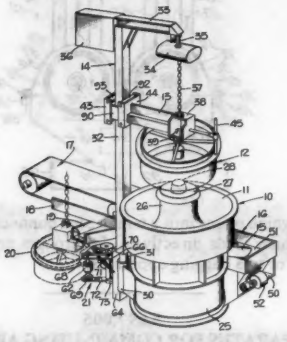
HOIST PANS AND HOIST PAN HANDLING APPARATUS

Bernard S. Reckseit, Cincinnati, and George A. Burgess, Fairfield, both of Ohio, assignors to Sweco, Inc., Los Angeles, Calif.

Filed May 19, 1969, Ser. No. 825,862
Int. Cl. B02c *17/00*
U.S. Cl. 241—171 **13 Claims**

A material handling system for vibratory finishing or grinding mills into which are placed materials and abrasive media and wherein the materials are operated upon. In a finishing mill the materials are parts which are finished, polished, or deburred, and in a grinding mill the materials usually are chemicals which are reduced in size. The system includes a vibratory mill into which such materials and media are placed, a vibratory screen separator for separating the materials from media after completion of the operation thereon, a hoist pan for handling the media or material and media, and a jib hoist system for moving and positioning the pan. Media or material and media are loaded into the pan, and same is lowered to the top of the finishing machine causing the load to be evenly

dumped into the finishing machine. After the finishing operation, the material may be moved or transported in any suitable manner to any further operation stage, and the media is returned to the hoist pan. A pan driving mechanism is provided for rotating the pan as the media is supplied thereto from the separator or mill such that the pan is evenly loaded. Several bottom-dumping pan configurations are disclosed which provide a relatively even discharge of the media into the mill when the pan engages the mill.



3,697,007

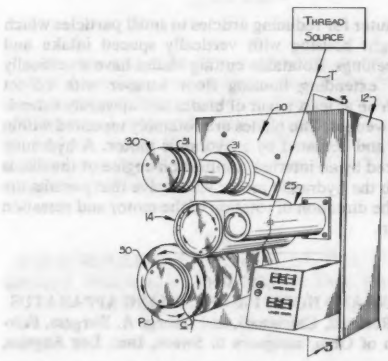
WINDING APPARATUS

Larry H. Taylor; William D. Porter; William J. Anderson, all of Asheville, N.C., and Ralph Caneer, Taylor, S.C., assignors to Northrop Carolina, Inc., Asheville, N.C.

Filed Oct. 6, 1970, Ser. No. 78,542

Int. Cl. B65h *54/42*

U.S. Cl. 242—18 DD **11 Claims**



Winding apparatus characterized by maintaining a desired pressure relationship between drive and package rolls for consistency in the winding operation. The apparatus comprises a driven drive roll rotatably mounted on a stationary housing in a fixed position, a freely rotatable linearly movable package roll driven by the drive roll and receiving material for winding thereon, carriage means having stationary and movable portions in which the movable portion carries the package roll for reciprocating linear movement, and means for maintaining a predetermined desired pressure relationship between the drive roll and the package roll and for linearly driving the package roll. The last-named means comprises a variable torque reversible motor, a screw shaft driven by the motor and a nut means secured to the movable carriage portion and receiving the screw shaft therethrough for converting rotary movement of the shaft into linear movement of the package roll. The torque motor can drive the package roll linearly toward and away from the drive roll for start-up and doffing and can hold a package roll in frictional peripheral driving engagement with the drive roll and maintain a predetermined pressure relationship.

3,697,008

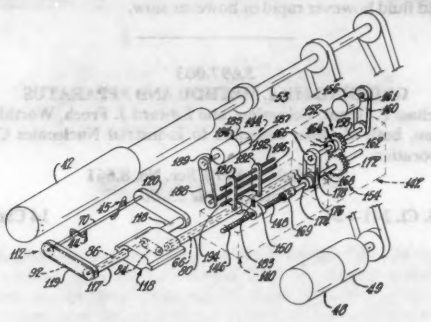
APPARATUS FOR PACKAGING LINEAR MATERIAL

Roy E. Smith, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Dec. 29, 1969, Ser. No. 888,706

Int. Cl. B65h *54/32*

U.S. Cl. 242—43 **2 Claims**



Apparatus for and method of packaging linear material such as a glass strand by advancing the linear material to a collector and reciprocating the advancing linear material across a zone while reciprocating the zone with increasing and decreasing stroke lengths.

3,697,009

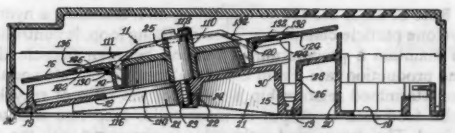
FILM CARTRIDGE FOR ENDLESS FILM

George J. Zahradnik, Wheaton, Ill., assignor to Elco Corporation, Jenkintown, Pa.

Filed April 16, 1970, Ser. No. 29,147

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 **12 Claims**

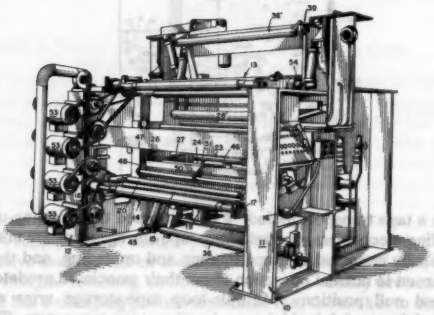


A film cartridge designed to carry an endless roll of film having a rotatably-mounted drive member with a central hub portion and a flange portion. The spiral roll portion of the endless film is disposed about the central hub portion and is loosely contained between the flange portion and a support surface perpendicular to the rotational axis of the drive member. The inner end of the spiral roll extends as a single loop upwardly and forwardly through a film guide passageway to the front wall of the cartridge, where there are openings provided in the film cartridge housing to receive the various movie projector operating components before returning to the outer convolution of the spiral roll.

The drive member has a pair of diametrically-opposed friction pads disposed on the innermost edge of the hub portion to impart a momentary increase in the frictional force applied to the innermost convolutions of the spiral roll during each revolution of the disc. To assist the spiral roll in moving its inner convolutions towards the hub portion, the space in between the flange portion surface and the support surface increases in a radial inward direction. The inner convolution is

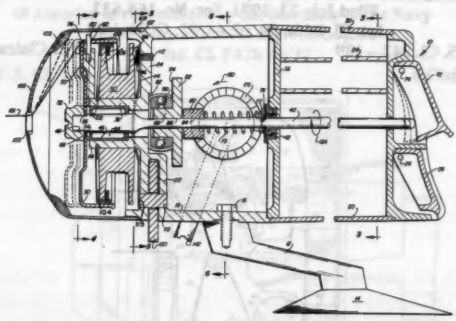
urged positively away from the disc by employing an annular step formed around the innermost end of the hub portion. The inner end of the spiral roll is pushed off the hub and towards the film gate by driving the disc at a speed greater than can be accommodated by the claw drive mechanism of the movie projector so that a compensated loop is formed in the film guide passageway to provide a supply of film for the claw drive mechanism used to advance the film frame by frame through the film gate.

3,697,010
WEB WINDER WITH IMPROVED TRANSFER
Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Inc., Green Bay, Wis.
Filed Jan. 20, 1971, Ser. No. 108,067
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 A **2 Claims**



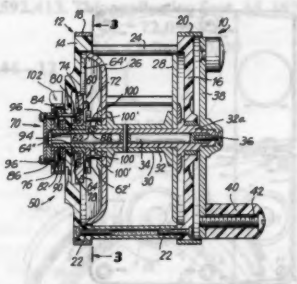
A winder having a double mandrel turret equipped with a cutoff having an air-assist to obtain a secure start on an empty mandrel after a portion of the web has been wound on the other mandrel.

3,697,011
FISHING REEL
Jay Arthur Christensen, Bloomington, Minn., and Theron Frank Compton, 571 Oak Street, Hugo, Minn., assignors to said Compton, by said Christensen
Filed Feb. 6, 1969, Ser. No. 797,088
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.1 A **3 Claims**



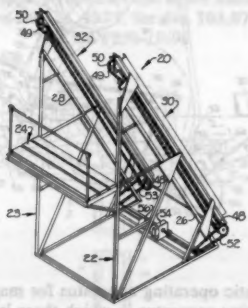
A spinning reel is provided with both manual crank operating means and battery operated motor means interconnected through a gear train to operate a pick-up rotor assembly. A plurality of one-way roller clutches are provided such that (1) when either the manual operating means or the motor operating means is functioning to retrieve the line the other will be disengaged from the gear train, and (2) both the manual operating means and the motor operating means as well as the gear train will be prevented from operation when the line is provided with drag as when a fish has been hooked.

3,697,012
FLY REEL
Archie L. Walker, 754 Winter Avenue, Uniondale, N.Y.
Filed July 9, 1970, Ser. No. 53,560
Int. Cl. A01k *89/02*
U.S. Cl. 242—84.51 R **1 Claim**



A fly reel including a brake mechanism for controlling the reel action as the fly line unwinds from the reel. A novel ratchet arrangement for the reel is also described. Specifically, the fly reel brake mechanism includes deformable spring plates connected by brake posts, all attached on one end of the fly reel, such that the brake mechanism is removable as a unit for replacement or repair. A threaded cap is used to force a greater frictional engagement of the brake mechanism and thus to control the braking force during run-out of the fishing line. The ratchet engagement includes a large and a small ratchet wherein the large ratchet operates with relative motion between the ratchet and its pawl during the run-out operation and the small ratchet operates during the winding motion of the reel.

3,697,013
YARN BEAM RACK
James T. Cobble, Dalton, Ga., assignor to B & J Machinery Co., Inc., Dalton, Ga.
Filed April 23, 1971, Ser. No. 136,711
Int. Cl. B65h *49/00*
U.S. Cl. 242—129.8 **10 Claims**



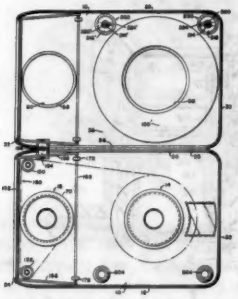
A yarn beam rack incorporating a system for applying a braking torque to the axles of each supported beam which automatically diminishes as the yarn is withdrawn from the beam such that the yarn tension required to rotate the beam and thereby withdraw the yarn remains substantially constant. The rack may also include a chain conveyor system for automatically loading and unloading a number of beams without the use of auxiliary lifting trucks or hoists.

3,697,014

TAPE HANDLING MECHANISM FOR COMPUTER

Alan B. Lowry, Canton; Gregory Mathus, Cambridge, both of Mass.; Herbert Morello, Phoenixville, and Robert J. Miller, Salford, both of Pa., assignors to Data Packaging Corporation, Cambridge, Mass. and Digital Information Devices, Inc., Norristown, Pa., part interest to each

Continuation of Ser. No. 781,875, Dec. 6, 1968, abandoned.
This application Nov. 27, 1970, Ser. No. 93,467
Int. Cl. G11b *15/58, 23/12*; G03b *1/04*
U.S. Cl. 242—182 34 Claims



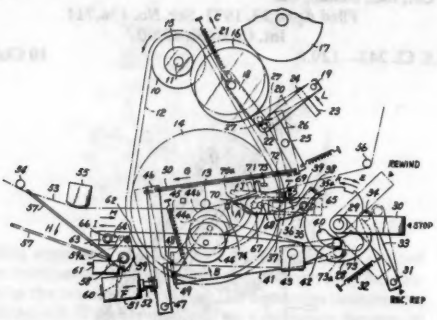
A cartridge having a stabilizer system for a standard IBM-type computer tape reel that may be placed in the cartridge for recording and subsequently be removed from the cartridge for use on a computer. A separate take-up reel is provided in the cartridge onto which the tape is wound. Each reel is movable axially and laterally in the cartridge and can be engaged by external drive spindles.

3,697,015

AUTOMATIC OPERATING CONTROL FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

Mitsuo Iwata, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Kanagawa-ken, Japan

Filed Jan. 26, 1971, Ser. No. 109,804
Claims priority, application Japan, Jan. 27, 1970, 45/7823
Int. Cl. B65h *59/38*; G03b *1/04*; G11b *15/32*
U.S. Cl. 242—186 6 Claims



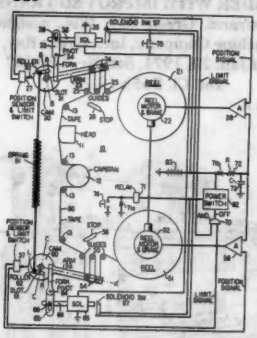
An automatic operating apparatus for magnetic recording and reproducing apparatus in which there is provided a cam integrally revolving by revolution of an operating knob, means for engaging a pinch roller cooperating with a capstan and an idler cooperating with a reel disk in a waiting position in association with the revolution of the cam, and means for releasing the pinch roller and idler from the waiting position by closing of a timer switch at a pre-set time thus starting an automatic recording or reproducing operation. There is further provided means for detecting the presence or absence of a magnetic tape and means for returning the cam to the stop position thereby stopping the recording or reproducing operation.

3,697,016

TAPE LOADING AND UNLOADING MECHANISM

Noel Arthur Leifer, Pine Brook, and Henry Walter Ott, Fairfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 21, 1971, Ser. No. 136,126
Int. Cl. B65h *59/38, 63/02*; G03b *1/04*
U.S. Cl. 242—189 8 Claims



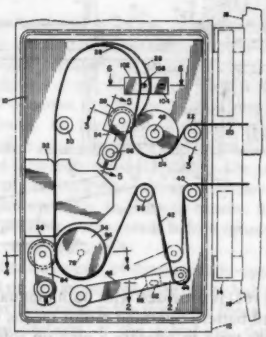
In a tape transport including the proposed tape loading-unloading mechanism, multiple-loop tape-storage arms are automatically retracted for tape loading and unloading, and then returned to normal operation about their associated predetermined null positions. Multiple-loop tape-storage arms are especially useful in high acceleration tape transports. The combination including an arm tension spring, a roller, a cam further including an elongated slot, and the reel motor-brake assembly is utilized during normal operation of the arm about its predetermined null position and during the arm retract-return sequence. Commercially available tape loading-unloading mechanisms require additional components, such as a motor, which remain idle during normal operation of the tape transport, in order to effect the retract-return function.

3,697,017

FILM TRANSPORT DECK UNIT

Lloyd M. Adams, Santa Ana, and Robert L. Hoelscher, San Diego, both of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed July 23, 1971, Ser. No. 165,632
Int. Cl. B65h *59/38, 63/02*; G03b *1/04*
U.S. Cl. 242—189 11 Claims



A film transport deck unit having a driven supply capstan and a driven film advance capstan, each with a pinch roller in

driving contact with its capstan to prevent slippage. In each capstan and pinch roller combination, the emulsion side of the film is held against a polished surface of one element and driven by a frictional surface of the other element. Film supply and take-up is controlled by sensing means having no physical contact with the film or the drive means. The unit is adaptable to existing camera and control apparatus.

3,697,018

REEL AND RETAINING MEANS FOR MOTION PICTURE FILM OR THE LIKE

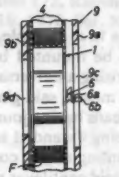
Gabriele Ehgartner, Pullach, and Herbert Wilsch, Unterhaching, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 28, 1971, Ser. No. 166,702

Claims priority, application Germany, July 31, 1970, P 20 38 082.9

Int. Cl. G03b *1/04*; G11b *15/32, 23/04*

U.S. Cl. 242—197 **10 Claims**



A supply real for motion picture film has a socket which can receive the free end of the innermost convolution of film, and an integral retaining device which can be readily broken off and has a clamping portion insertable into the socket to clamp the free end of the innermost convolution against the reel. The retaining device is further provided with an additional portion which extends beyond the socket when the latter received the clamping portion to serve as a means for preventing improper insertion of the reel into certain types of cassettes. The additional portion can be broken away from the clamping portion so that the reel, with the clamping portion inserted into the socket and with the additional portion broken away, can be inserted into cassettes of another type which do not permit insertion of reels with the additional portions of retaining devices extending beyond the sockets.

3,697,019

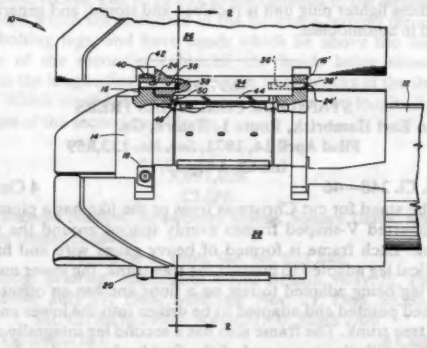
STABILIZING FIN ASSEMBLY

James K. Watson, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 13, 1970, Ser. No. 36,830

Int. Cl. F42b *13/32*

U.S. Cl. 244—3.29 **6 Claims**



A fin assembly for stabilizing aerial vehicles having a plurality of curved fins pivotally connected to a shroud on the vehicle for pivotal movement from a folded position to an erected position about axes parallel to the direction of flight of the vehicle. Each fin is locked in its erected position by a latch mechanism which includes a locking lug on the fin and a slot in the shroud to receive both the lug and a lug locking wedge which prevents movement of the fin in any direction from its erected position.

3,697,020

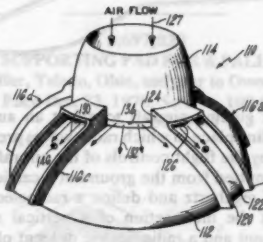
VERTICAL LIFT MACHINE

Raymond V. Thompson, Simsbury, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 836,393, June 25, 1969, Pat. No. 3,592,413. This application Sept. 14, 1970, Ser. No. 72,091

Int. Cl. B64c *29/00*

U.S. Cl. 244—12 **13 Claims**



A maneuverable lifting body wherein pressurized gas is discharged at supersonic velocity over the surface of at least three downwardly sloping lifting surfaces, the supersonically flowing gas separating and thereafter reattaching to the surface to provide a low pressure region intermediate the points of separation and reattachment. The low pressure region created on the upper surface, in cooperation with atmospheric pressure on the bottom of the body, results in vertical lifting forces which add to the vertical component of the momentum forces of the gas. Attitude control and maneuverability are accomplished by selectively venting ambient air into the low pressure regions whereby the low pressure region may be selectively destroyed with resultant force unbalance.

3,697,021

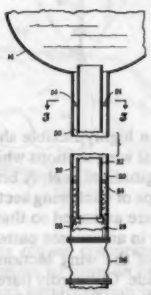
GEYSERING INHIBITOR FOR VERTICAL CRYOGENIC TRANSFER PIPE

Frank S. Howard, Indian Harbor Beach, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1971, Ser. No. 103,078

Int. Cl. F25b *19/00*

U.S. Cl. 244—1 SB **1 Claim**



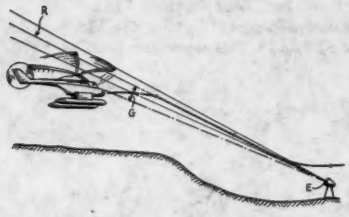
A geysering inhibitor utilizing a thin wall tube carried within a vertical pipe which enables convective circulation of a liquid cryogen for preventing the liquid cryogen from geysering as a result of heat input to the vertical pipe.

3,697,022

METHOD AND APPARATUS FOR AIRCRAFT GUIDANCE

Denis Autechaud, Paris, and Jean-Claude Grisard, Boulogne Billancourt, both of France, assignors to Societe De Fabrication D'Instruments De Mesure (SFIM)

Filed July 6, 1970, Ser. No. 52,388
Int. Cl. B64c 13/50
U.S. Cl. 244—17.13 20 Claims



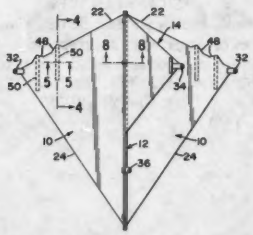
A method of guiding aircraft to effect an automatic approach to a landing place in which radar waves are transmitted to be received by the flight controls of the aircraft. The radar waves are transmitted from the ground at a carrier frequency of the order of gigahertz and define a radioelectric guiding axis situated at the intersection of a vertical radioelectric plane of alignment and a radioelectric descent plane perpendicular to the vertical plane and inclined to the horizontal. The method is particularly suitable for use with helicopters. Apparatus for carrying out the method includes a transmitter on the ground for transmitting radar waves of very short wavelength and equipment on board the helicopter comprising a receiver for the radar waves connected by a coupler to an automatic pilot of the helicopter flight controls.

3,697,023

KITE

Richard R. Jackson, 8 Trinity Road, Marblehead, Mass.

Filed May 12, 1971, Ser. No. 142,492
Int. Cl. B64c 31/06
U.S. Cl. 244—153 R 12 Claims



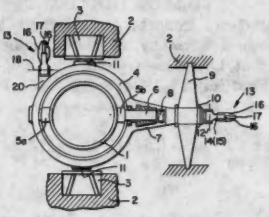
A kite is formed from highly flexible sheet of material and has a pair of symmetrical wing sections which extend transversely from a central longitudinal keel. A bridle is connected to the kite at the lateral tips of each wing section and to the keel. The lines of the bridle are arranged so that, in flight, the wing sections will billow out in an arcuate pattern in which the outermost ends of each of the wing sections are disposed in a generally vertical attitude. Outwardly flared tabs are provided at the leading edge of the outermost ends of the wings to maintain the billowed configuration of the kite and to preclude inward buckling of the outer generally vertical regions of the wings.

3,697,024

ROTOR MAST SUPPORT FOR HELICOPTERS

Karl-Heinz Kosziech, Friedrichshafen, and Kurt Teschner, Immenstaad, both of Germany, assignors to Dornier A.G., Friedrichshafen/Bodensee, Germany

Filed Jan. 21, 1971, Ser. No. 108,295
Claims priority, application Germany, Feb. 26, 1970, P 20 08 977.4
Int. Cl. B64c 27/04; F16f 15/10
U.S. Cl. 248—15 5 Claims



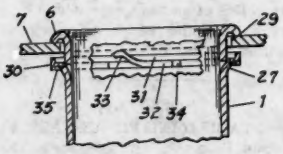
This invention relates to a movable rotor mast support for helicopters adapted to be mounted between the rotor mast and the airframe comprising a universal joint including gimbal ring means and journal means, said gimbal ring means including lateral cantilever means having journal means therein, said latter journal means being extended to form a torsion spring rod, and rotation-preventing means connecting the end of the torsion spring rod with said cantilever means.

3,697,025

NECK-MOUNTED LIGHTER SOCKET

Jones B. Edwards, 1923 Woodcrest Avenue, Apt. 6, Charlotte, N.C.

Filed July 1, 1970, Ser. No. 51,454
Int. Cl. G12b 9/02; F23g 7/22
U.S. Cl. 248—27 7 Claims



A neck-mounted socket or holding device with a thermostatic latch for an electric pop-out cigarette lighter, in which a cordless lighter plug unit is received and stored, and generally used in automobiles.

3,697,026

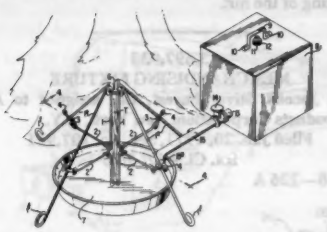
STAND FOR CHRISTMAS TREES

John Earl Hambrick, Route 1, Hahira, Ga.

Filed April 14, 1971, Ser. No. 133,859
Int. Cl. A47g 33/12
U.S. Cl. 248—46 4 Claims

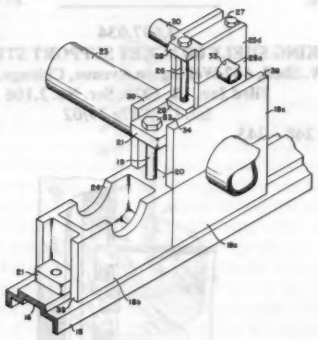
The stand for cut Christmas trees or the like has a plurality of inverted V-shaped frames evenly spaced around the tree trunk. Each frame is formed of heavy gauge wire and has a vertical leg adapted to contact the tree trunk, the lower end of the leg being adapted to rest on a floor and has an offset upturned pointed end adapted to be driven into the lower end of the tree trunk. The frame also has a second leg integrally connected with the upper end of the first leg by a coil and it extends downwardly and outwardly and has a lower portion

adapted to rest on the floor. A link between the legs is provided to adjust the spaced relation of the lower ends of the legs



to thereby support the tree trunk substantially perpendicular to the floor. A flexible cord is secured around the tree trunk and passes through all the coils.

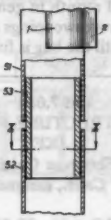
3,697,027
TUBE CLAMP
Donald A. Girard, P.O. Box 172, Rancho Cordova, Calif.
Filed Dec. 10, 1970, Ser. No. 96,868
Int. Cl. F16l *3/10, 3/22*
U.S. Cl. 248—68 CB **10 Claims**



Multiple layers of substantially parallel tubes are fastened to a structure which extends generally transversely to the tubes by two rows of opposed large blocks along the structure and two rows of opposed small blocks, the blocks of each row having at each end at staggered locations bolting lugs and the blocks in each row being terminally juxtaposed with the lugs overlapping. The mating faces of each pair of rows have tube-receiving recesses. The large blocks have anchor means (internally threaded holes) which receive the bolts which secure the small blocks. Each block has a pair of longitudinal flanges on the outer face (away from the mating face) to define a longitudinal recess. The large blocks are fastened to the structure by bolts which are anchored in the structure, extend through the bolting lugs, and have heads which lie above the outer faces of the second-row blocks, the heads being situated within the longitudinal recesses of the small blocks of the third row, which small blocks are nested between the longitudinal flanges of the second-row blocks.

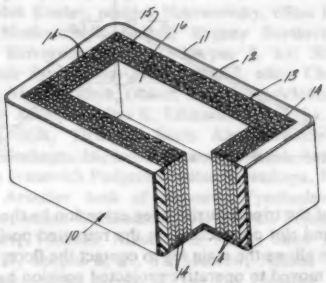
3,697,028
CLIPS
Neil Duncan Nimmo, Strawberry House, Square Drive, Kingsley Green, England
Filed May 9, 1969, Ser. No. 823,444
Claims priority, application Great Britain, May 27, 1968, 25225/68; July 17, 1968, 34007/68; Nov. 21, 1968, 55350/68
Int. Cl. A47g *29/02;* **A44b** *21/00;* **E04h** *1/00*
U.S. Cl. 248—121 **5 Claims**

A clip which can be snapped-on to a tube, the clip having an arcuate gripping part and a foot. The clip may be made of aluminum alloy and the tube can have an oval passageway which can co-operate with an oval cam-locking tube for use in join-



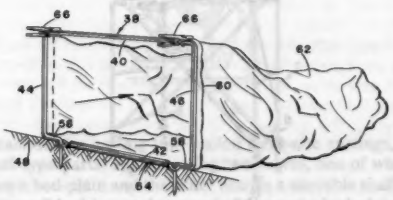
ing two tubes together. The aluminum alloy clip may be made by extrusion.

3,697,029
SUPPORTING PAD FOR A PALLET
Fred E. Lauffer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Dec. 23, 1970, Ser. No. 100,914
Int. Cl. B65d *19/44*
U.S. Cl. 248—188.8 **1 Claim**



A pad for supporting a pallet, the pad comprising a container-like shell, a compression-resistant composite material disposed within the shell, which is comprised of a rigid paperboard embedded into a foamed urethane plastic, the material filling at least a portion of the shell and coextensive with the depth of the shell, providing a pallet support.

3,697,030
MATERIAL COLLECTING MEANS
Pius Dale Schultz, 16 Maple Road, York, Pa.
Filed Dec. 11, 1970, Ser. No. 97,171
Int. Cl. B65b *67/12*
U.S. Cl. 248—101 **6 Claims**



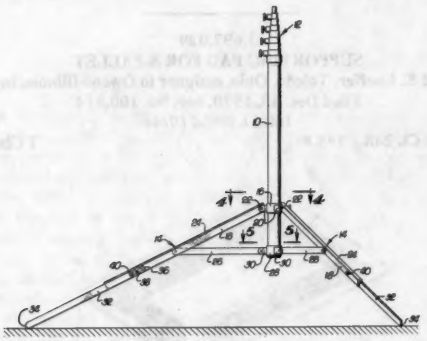
Material collecting means comprising a frame formed of rigid elongated members to form an open geometrical figure such as a right-angled parallelogram having a pair of prongs extending downward from opposite sides and adapted to be projected into the ground to support the frame in substantially perpendicular position. Several embodiments are provided which respectively are of a rigid and a collapsible nature. The

frame is adapted to have an elongated, flexible collection bag disposed with its open mouth folded around the members comprising the frame and connected thereto by clamping means so as to hold said mouth in generally rectangular position to receive leaves, lawn sweepings and the like, which may be swept into the bag until the bag is full.

3,697,031
EXTENSIBLE LEG STRUCTURE FOR TRIPOD OR THE LIKE

Richard B. Glickman, Sherman Oaks, and George R. Hartz, Canoga Park, both of Calif., assignors to Berkey/Colortran, Inc.

Continuation-in-part of Ser. No. 37,158, May 14, 1970. This application Dec. 14, 1970, Ser. No. 97,813
Int. Cl. F16m *11/38*
U.S. Cl. 248—171 **4 Claims**

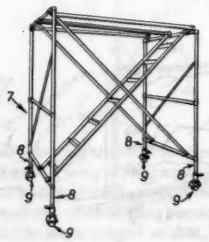


Each leg of the tripod carries a leg extension by the aid of a simple pin and slot connection. In the retracted position the leg extension allows the main leg to contact the floor. The leg extension is moved to operative projected position by a combination of simple angular and sliding movements. The leg extension can be, and normally is, locked against angular movement in both retracted and projected positions.

3,697,032
SCAFFOLDING

Douglas Henry Pearce, Berkhampsted, England, assignor to Access Equipment Limited, Hemel Hempstead, England

Filed Dec. 15, 1969, Ser. No. 884,969
Claims priority, application Great Britain, Dec. 19, 1968, 60,413/68
Int. Cl. E06f *7/28*
U.S. Cl. 248—188.4 **9 Claims**

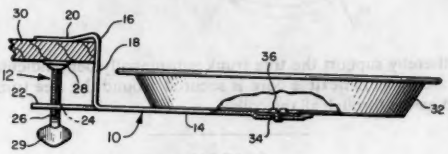


A leg of adjustable length, for scaffolding, has an externally screw threaded leg member slidably received in an upright tubular scaffolding member the lower end of which abuts a nut on the leg member rotatable to provide fine adjustment of the leg length. The nut has a lever arm and is tiltable to disengage its screw threads from the screw threads of the leg member to provide for coarse adjustment of the leg length. The tubular scaffold member normally seats in a recess in the nut to prevent tilting of the nut.

3,697,033
MERCHANDISING FIXTURE

Donald R. Jacobs, River Forest, Ill., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 20, 1971, Ser. No. 107,981
Int. Cl. A47f *5/00*
U.S. Cl. 248—226 A **1 Claim**

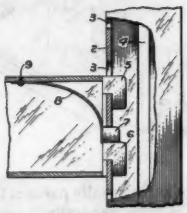


A merchandising fixture for displaying a stack of articles has a clamp for attaching the fixture to the edge of a shelf and a support arm adapted to have attached thereto one of said articles to form a base for the stack thereof.

3,697,034
LOCKING SHELF BRACKET SUPPORT STRUCTURE

Irving W. Shell, 442 Wellington Avenue, Chicago, Ill.

Filed Jan. 12, 1970, Ser. No. 2,106
Int. Cl. A47g *29/02*
U.S. Cl. 248—243 **1 Claim**



A lockable coupling is provided for shelving assemblies employing bracket members and upright members which are assembled to each other in a cantilever fashion. The coupling incorporates hook-shaped projections at the end of the bracket members which engage receiving slots in the upright members, and in addition, a spring biased bar is provided at the end of the bracket member which springs outward into one of the receiving slots in the upright member upon completion of assembly of the two members.

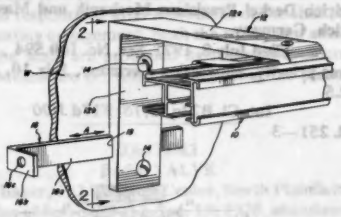
3,697,035
DRAPERY SUPPORT

George H. Baker, Sr., Dunlap, Ill., assignor to Baker Drapery Corporation

Filed Dec. 14, 1970, Ser. No. 97,592
Int. Cl. A47h *1/142*
U.S. Cl. 248—260 **7 Claims**

In a drapery support assembly which has a generally horizontal traverse track supported by brackets along a wall or the like, with the track spaced from the wall, and the track being adapted to have a drapery panel attached thereto, a generally L-shaped return hook plate for receiving one end of the drapery panel around one end of the track adjacent the wall. The L-shaped return hook plate has a horizontal portion clamped between a bracket adjacent one end of the track and the wall and held therebetween by pressure between the bracket and wall, and an arm portion extending outwardly

from the wall for attaching the end of the drapery panel thereto. By loosening the bracket, the return hook plate is adjustable lengthwise of the track, transverse to the bracket, to compensate for different lengths of track extending beyond the bracket.

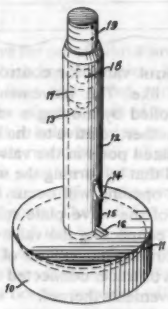


3,697,036

PATTY-FORMING DEVICE

Maurice S. Kanbar, 4 East 77th Street, New York, N.Y., and Salvatore Benenati, 1603 Givan Avenue, Bronx, N.Y.

Filed March 11, 1970, Ser. No. 18,547
Int. Cl. A22c 7/00
U.S. Cl. 249—74 **5 Claims**



A food-patty-forming device in which moldable food, such as ground meat, is receivable within a molding cup and is caused to assume the shape thereof, the cup having an adjustable molding plate therein whose position relative to the base of the cup determines the thickness of the patty. The base of the cup is attached to one end of a cylinder serving as the handle of the device, a piston secured to the molding plate being telescoped within the device to an extent limited by an adjustable screw operated by a control knob projecting from the other end of the cylinder. The knob is calibrated in terms of patties per pound whereby the position of the molding plate may be set to provide a predetermined number of patties, all having the same thickness.

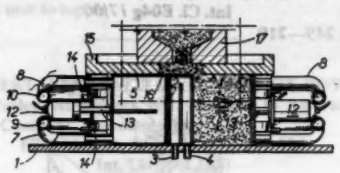
3,697,037

CLUSTER CASTING APPARATUS FOR WORKPIECES MADE OF POURED MOLTEN REFRACTORY MATERIAL

Joseph Recasens, Sorgues, France, assignor to L'Electro-Refractaire, Paris, France

Filed May 26, 1971, Ser. No. 146,962
Claims priority, application France, May 26, 1970, 7019102
Int. Cl. B22d 27/04
U.S. Cl. 249—81 **10 Claims**

The invention relates to an apparatus for cluster casting of workpieces made of refractory material. This apparatus comprises a bottom plate; metallic wedges cooled internally, mutually spaced, arranged circularly and radially around a cooled core resting on the bottom plate; vertical and top means confining the volumes between the wedges, said top means delimiting a central aperture communicating with said volumes and through which a molten refractory material is poured, and said wedges being movable from a position where they are in contact with the core (for the casting) to a position where they are apart from said core (for extracting the cluster). This apparatus is useful, for example, for producing plates, workpieces derived from the plate form as well as pump rotors.

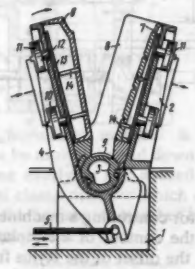


3,697,038

MACHINE FOR CASTING THIN-WALLED LARGE-SIZE PIECES

Emelyan Semenovich Stebakov, ulitsa Lobanchevskogo, 82, kv. 15; Alexandr Ivanovich Leontiev, ulitsa Vishnevskogo, 9, korpus 2, kv. 33; Petr Mikhallovich Simpura, ulitsa Perekopskaya, II, korpus 2, kv. 90, all of Moscow; Ivan Ivanovich Kozlov, poselok Nekrasovsky, ulitsa L. Tolstogo, 15/1, Moskovskaya Oblast; Evgeny Borisovich Glotov, ulitsa Krivorozhshaya, 21, korpus I, kv. 30, Moscow; Alexandr Stepanovich Musiyachenko, ulitsa Chapaeva, 17, kv. 61, Moskovskaya Oblast, Skhodnya; Vladimir Alexandrovich Antonov, ulitsa K, Libknekhta, 146, kv. 11, Moldavskaya SSR, Tiraspol; Boris Alexandrovich Vshivkov, ulitsa Gorkogo, 16, kv. 9 Primorsky Krai, Arseniev; Sevantyan Ivanovich Podgorny, ulitsa Sovetskaya, 9 Primorsky Krai, Arseniev both of Moscow; Vyacheslav Petrovich Zubkov, ultisa Lomonosova, 24, kv. 65, Primorsky Krai, Arseniev; Vladimir Nikolaevich Milov, ulitsa Krivorozhskaya, 27, korpus 2, kv. 67, Moscow; Nikolai Viktorovich Navrotsky, ulitsa Junost, 17, kv. 113, Tiraspol, and Leonid Alexandrovich Nikolsky, Dokhturovsky pereulok, 20, kv. 13, Moscow, all of U.S.S.R.

Filed May 10, 1971, Ser. No. 141,824
Int. Cl. B28b 7/10
U.S. Cl. 249—137 **2 Claims**



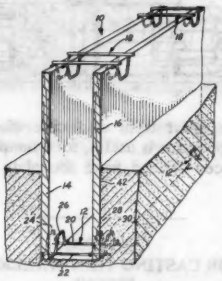
A machine for casting thin-walled large-size castings, such as panel-type parts, incorporating two leaves, one of which is fixed on a bed-plate and the other one on a movable shaft having a reversible drive, and secured on the same bed-plate. The shaft exterior is formed with a recess extending along the shaft length and further through the spacing between the leaves, the depth of the recess is adequate to accommodate the metal crust formed on the shaft surface from the moment the pouring process is started until the shaping of a piece being cast is completed; the machine leaves are provided with means for detaching and releasing the cast pieces from the half moulds.

3,697,039

CONCRETE FORM CLIP

Thomas E. Phelps, 700 Campbell Drive, and Ben F. Kraft, 531 Parkway East, both of, Las Vegas, Nev.

Filed Jan. 21, 1970, Ser. No. 4,623
Int. Cl. E04g *17/00*
U.S. Cl. 249—219 5 Claims



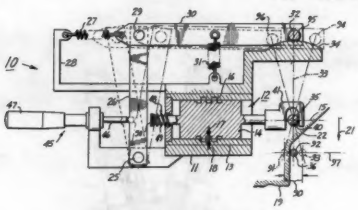
A concrete form assembly in which a plurality of lower clips are mounted in engagement with the bottom of a pair of sheet sides. A second plurality of upper concrete clips engage the top f the sheet sides and cooperate with the lower clips to hold the sheet sides in a substantially vertical attitude to hold the sheet sides in position while wet concrete is poured into the space between the sheet sides. All of the clips are identical in their construction. Each clip includes a pair of parallel spaced rails and a pair of U-shaped braces fixed to each end of the pair of spaced rails for engaging the sheet sides and holding the sheet sides upright.

3,697,040

TOOL OFFSET MEANS FOR TRACER MECHANISMS

Paul J. Weaver, San Marino, Calif., assignor to Automatic Control Systems, Inc., El Monte, Calif.

Filed Dec. 23, 1970, Ser. No. 100,955
Int. Cl. B23q *35/18*
U.S. Cl. 251—3 12 Claims



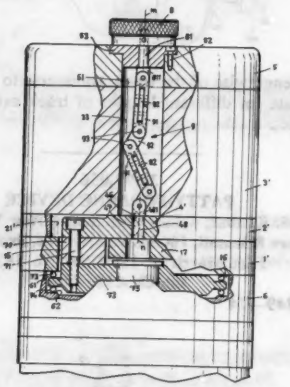
A tracer valve for controlling a machine tool for duplicating on a workpiece the contour of a template or pattern. For a given tool setup, the offset of the stylus from the tracer valve sensor is known and geometry, for in the system's geometry. including the geometry of the tools being used. However, when a different machining operation is to be performed, or when a new tool is used for a second operation of the same kind, the offset must often be changed. This invention provides a means for pre-setting and for changing tool offsets in order that sequential operations can be carried out without changing the template and even without changing the tool for a given setup. It includes a stylus support having three pivoted links and four pivots, one pivot being a joinder with the tracer sensor whereby the latter is semi-fixed in space and acts as a fulcrum in determining the offset of the stylus tip from the tracer sensor.

3,697,041

HYDRAULIC CONTROL VALVE HAVING LATERALLY AND ROTATIONALLY DISPLACEABLE VALVE PLATE

Konrad Bschorer, Wolfratshausen, Germany, assignor to Friedrich Deckel Prazisions Mechanik und Maschinenbau, Munich, Germany

Filed July 8, 1971, Ser. No. 160,594
Claims priority, application Germany, July 10, 1970, P 20 34 432.5
Int. Cl. B23q *35/18*; F17d *3/00*
U.S. Cl. 251—3 9 Claims



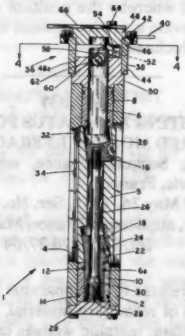
A hydraulic control valve for controlling copying-milling machines and the like. The movements of the associated machine are controlled by moving a valve plate laterally in one direction or another, relative to the fixed valve body. The edges of the associated ports in the valve plate and the valve body are so shaped that by turning the valve plate, a larger or smaller valve port opening will occur for a given extent of lateral movement of the valve plate relative to the body. A pivoted link chain connecting the valve plate to an actuating knob controls the turning movements of the valve plate, and a conventional stylus or tracer connected to the valve plate controls the lateral movements thereof.

3,697,042

DUAL ACTION BUTTERFLY VALVE

Henry R. Killian, Greensburg, Pa., assignor to Walworth Company, Bala Cynwyd, Pa.

Continuation-in-part of Ser. No. 843,510, July 22, 1969. This application Jan. 21, 1971, Ser. No. 108,323
Int. Cl. F16k *5/20*
U.S. Cl. 251—163 6 Claims



A rotatable valve structure, such as a butterfly valve, wherein the shaft is movable axially, with a camming surface

on the shaft engaging a complementary camming surface on the disc to produce transverse movement of the valve disc in response to axial movement of the shaft. Hence, the valve disc may be turned to a face-to-face position relative to the seat and then, in response to axial movement of the shaft, pressed into firm seating engagement. Both the rotary and axial movements of the shaft are produced by rotary movement of an operator. Means are provided for adjusting the plane of the disc.

3,697,043

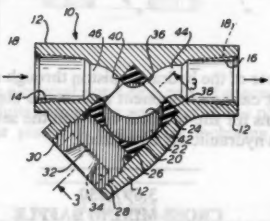
BALL VALVE

Joseph W. Baker, 193 Rutledge Center, North Plainfield, N.J.

Continuation of Ser. No. 3712, Jan. 19, 1970, abandoned. This application Dec. 8, 1971, Ser. No. 206,111

Int. Cl. F16k 5/06

U.S. Cl. 251—315 **6 Claims**



An in-line ball valve for on-off, throttling or diverting operation in a fluid line which has a one-piece housing with integral and axially aligned inlet and outlet ports or chambers terminating at orifices in adjacent walls of the valve's main cavity is disclosed. The ball is held between an annular sealing ring and an annular support ring coaxially aligned in an access bore of the housing that is positioned between the inlet and outlet ports and is directed at an angle to the common axes of the in-line inlet and outlet ports. The ball has a non-linear passage which, upon rotation of the ball, is operative selectively to provide and prevent communication between the inlet and outlet ports through the access bore in the housing. The angularly directed access bore is provided with a threaded plug at its outer end which permits adjustment of the sealing ring as well as the torque required to rotate the ball in the valve even while the valve is in operation. Further, the plug can be removed from the access bore to permit repair or replacement of the ball and ring assembly without disturbing the connecting fittings in the fluid line.

3,697,044

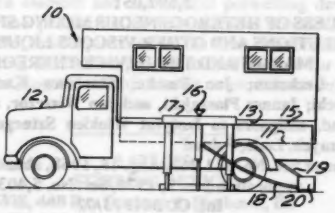
CAMPER UNIT LIFTING DEVICE

Leon Kowalski, 6162 Fleming Street, Vancouver 15, British Columbia, Canada

Filed March 26, 1971, Ser. No. 128,312

Int. Cl. B66f 7/26

U.S. Cl. 254—45 **11 Claims**



Lifting device, operable by one operator, for lifting camper units on and off trucks. Hydraulic equalizer supplies equal volume flows of fluid to hydraulic jacks of jacking devices which carry camper unit. Jacks are straddled by telescoping guides to reduce bending moments on jacks. Jacking devices are canted inwards from bases of jacking devices, increasing stability of camper unit when carried on jacking devices. Equalizer ensures equal extension of jacks, reducing tendency of camper unit to topple.

3,697,045

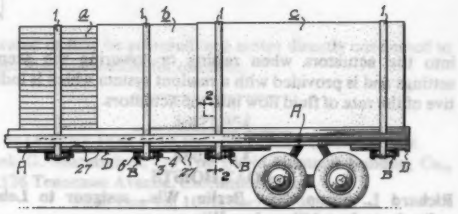
ADJUSTABLE WINCH FOR CARGO TIE-DOWN

Holt A. Farley, Annandale, N.J., assignor to American Aluminum Company, Mountainside, N.J.

Filed May 11, 1971, Ser. No. 142,176

Int. Cl. B66f 1/00

U.S. Cl. 254—51 **6 Claims**



A U-shaped winch frame has a winding drum for a flexible tie-down element journaled in its arms which have notches in their opposite edges into which extend inwardly projecting flanges on a track which is fixedly secured to the body of a vehicle so that the winch can be freely slid along said track into different positions relative to the truck body and the cargo load thereon.

3,697,046

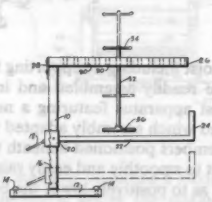
COMBINED, JACK, AND CLAMP, SURE, CLAMP

Ferdinand F. Sur, RR 3, Effingham, Ill.

Filed Sept. 25, 1969, Ser. No. 860,941

Int. Cl. B66f 1/06

U.S. Cl. 254—111 **4 Claims**



An elongated horizontal member is adapted by jack operated means to be moved up and down in a vertical plane. A horizontal frame overlying and spaced from the member contains a vertical clamp member which can be moved into engagement with the horizontal member in any one of a plurality of available positions.

3,697,047

FLUID ACTUATED STAGE CONTROL SYSTEM WITH FLUID FLOW READOUT SIGNAL

William M. Cruse, 333 North Norton Avenue, Los Angeles, Calif.

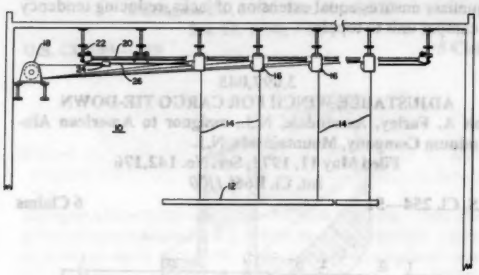
Filed Dec. 18, 1969, Ser. No. 886,222

Int. Cl. A63j 1/02

U.S. Cl. 254—141 **16 Claims**

An arrangement for raising and lowering the various movable scenery settings of a theater stage by fluidic control systems. The actuators employed may be utilized as structural tie members providing lateral support for the building beam

elements. The control system may be transferred between groups of actuators to economize on installation cost. Furthermore the control system selectively directs pressurized fluid

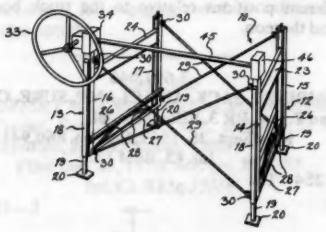


into the actuators when raising or lowering the scenery settings and is provided with a readout system which is indicative of the rate of fluid flow into the actuators.

3,697,048
BOAT HOISTS

Richard L. Sarno, New Berlin, Wis., assignor to Leisure Products, Inc., Milwaukee, Wis.

Filed Jan. 22, 1971, Ser. No. 108,897
Int. Cl. B63c *23/60*
U.S. Cl. 254—148 **6 Claims**



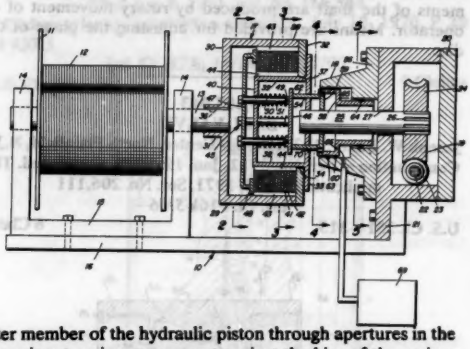
A novel boat hoist including a supporting framework which is designed to be readily assembled and installed wherever desired, said hoist apparatus featuring a new and improved manually-actuated winch assembly adapted to simultaneously actuate lifting members positioned beneath the bow and stern portions of a boat to smoothly and easily raise said boat out of the water as well as to positively lower the boat into the water when desired, said improved elevating mechanism being simpler in design and operation than those heretofore employed in boat hoists of the general type herein concerned.

3,697,049
WINCH DRUM DRIVE AND CONTROL

David B. Wallace, 630 Camp Circle, Birmingham, Ala.

Filed April 22, 1971, Ser. No. 136,324
Int. Cl. B66d *1/00*
U.S. Cl. 254—187 R **5 Claims**

There is provided in a winch structure, rotational speed reduction gearing in a fixed housing supporting an hydraulic actuator piston housed in an extension of the rotational speed reduction gearing, the piston being centrally open through inner and outer relatively rotatably connected members thereof, through which central opening a power output shaft of a rotational speed reduction worm gear extends and is connected to rotate with a power input casing component of a selectively slip, normally non-slip coupling, and a power output component of the casing is connected relatively rotatably with the power input casing component and to rotate with a drum of the winch, there being discs in the casing in sets connected respectively to rotate with the casing components and biased by spring-loaded means in the casing to maintain non-slip conditions between the sets and be actuated by lugs on the

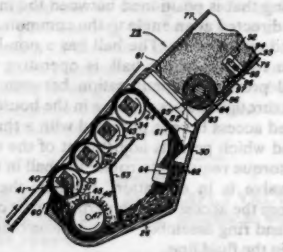


outer member of the hydraulic piston through apertures in the power input casing component against the bias of the spring-loaded means for slip to occur between the sets of discs when the piston is hydraulically energized.

3,697,050
CROSS-MIXING BAFFLE

Michael R. Stanley, 32 Arlington Drive, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1970, Ser. No. 97,688
Int. Cl. B01f *15/04*
U.S. Cl. 259—4 **4 Claims**



A cross-mixing device which is arranged in the flow stream of electrostatic developing material for mixing the material as it flows therethrough. The device is formed with a plurality of deflection elements which effect small incremental movements of some of the material from some zones of the flow stream transversely to other zones thereof utilizing gravitational forces exclusively.

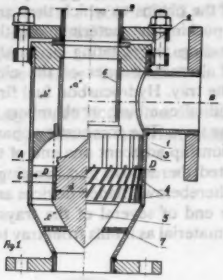
3,697,051
PROCESS OF HETEROGENEOUS MIXING SPINNING SOLUTIONS AND OTHER VISCOUS LIQUIDS OR MASSES AND THE DEVICE THEREOF

Rudolf Lachman; Jan Paszke; Stanislaw Kansy; Henry Pstrocki; Janusz Ploszajski, and Jan Wiszczor, all of Lodz, Poland, assignors to Instytut Wlokien Sztucgnych i Syntetycznych, Lodz, Poland

Division of Ser. No. 811,263, Aug. 15, 1968, abandoned. This application Jan. 2, 1970, Ser. No. 5,403
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **3 Claims**

Apparatus for mixing spinning solutions comprising a housing having a pair of inlet chambers and an outlet with a third chamber upstream of the outlet: a divider in the housing com-

municates the two inlet chambers with the third chamber so that streams from the inlet chambers are uniformly distributed over the cross-section of the third chamber in alternation. The



divider includes a central core; or a pair of spaced apertured plates with conduits connecting apertures in one plate to apertures in another plate; or a structure including concentric rings.

3,697,052

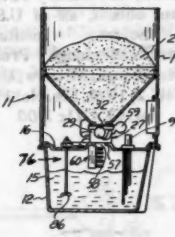
AUTOMATIC VOLUMETRIC CHEMICAL MIXER

Fred A. Andris, 671 East Elmwood, Troy, Mich.

Continuation of Ser. No. 865,009, Oct. 9, 1969, abandoned. This application March 22, 1971, Ser. No. 165,829

Int. Cl. B01f 7/16

U.S. Cl. 259—8 **46 Claims**



An automatic volumetric chemical mixer which has a mixing tank with agitator, an electronic liquid level control and a tank cover together with a hopper secured to said cover for delivering of dry granular chemicals, a power operated chemical feed metering mechanism between the hopper and cover to deliver to the tank predetermined quantities of chemical for a given time element and a chemical prewetting device for facilitating the production of homogenious solutions in the tank, with the total liquid feed to the tank delivered through the prewetting device in a predetermined volume for a given time element, together with a circuit to provide an automatic operation.

3,697,053

STIRRING DEVICE

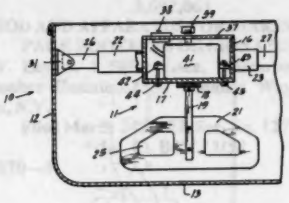
Michael J. Will, 448 Rex Boulevard, Elmhurst, Ill.

Filed May 10, 1971, Ser. No. 141,611

Int. Cl. B01f 7/16

U.S. Cl. 259—108 **10 Claims**

This invention relates in general to stirring devices and in particular to an appliance that may be detachably mounted in a cooking container and energized for stirring material in the container. The appliance may be spring driven, battery



operated or may be powered by a motor directly connected to power in a wall socket, for example.

3,697,054

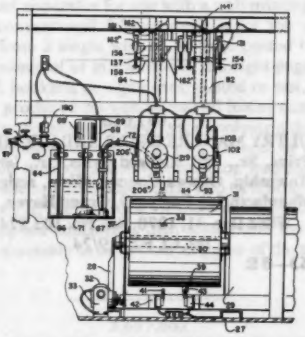
MACHINE FOR MAKING BATCHES OF MORTAR

Frank G. Moratschek, c/o The David Hummel Building Co., 1326 Tennessee Avenue, Cincinnati, Ohio

Filed Dec. 10, 1970, Ser. No. 96,831

Int. Cl. B28c 7/04

U.S. Cl. 259—154 **2 Claims**



A mortar mixing machine including a mixing hopper, weigh frames pivotally mounted above the mixing hopper, weigh hoppers mounted on the weigh frames, conveyors for advancing granular solid material to the weigh hoppers, and means for supplying a predetermined amount of water to the mixing hopper. Switches are actuated by the weigh hoppers to arrest the conveyors when there is a predetermined weight of the sold material in the weigh hopper. The contents of the weigh hoppers is dumped into the mixing hopper after the water has been supplied thereto to be mixed to form a batch of mortar.

3,697,055

HEAT TREATMENT OF BODIES OF COMBUSTIBLE MATERIAL

Cyril Walker Cooper, deceased, late of Pontefract, England, and by Edgar Knight, executor, Leeds, England, assignors to Cawood Wharton & Company Limited, Yorkshire, England

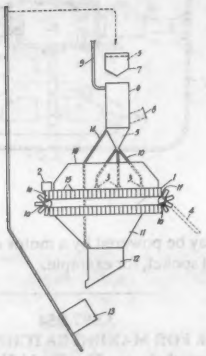
Filed Sept. 18, 1970, Ser. No. 73,362

Int. Cl. F27b 9/24

U.S. Cl. 263—8 R **6 Claims**

A method of and apparatus for heat treating bodies of combustible material in which a bed of bodies is continuously moved by means of a conveyor which is capable of conveying

the bed in such manner that the individual bodies do not move relatively to one another or to the conveyor and in which



heated granular material is passed through the conveyed bed so as to transfer heat to the individual bodies.

3,697,056

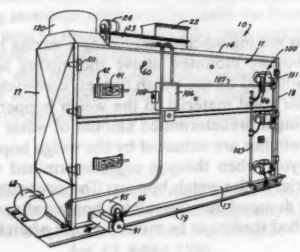
POULTRY MANURE DRIER AND STERILIZER

Richard Prins, Sr., and Richard Prins, Jr., both of Grand Haven Township, Ottawa County, Mich., assignors to Wolverine Manufacturing Company, Grand Haven, Mich.

Filed Dec. 31, 1970, Ser. No. 103,274

Int. Cl. F27b 9/24

U.S. Cl. 263—8 R **11 Claims**



An animal waste material drier and sterilizer and more particularly a poultry manure drier and sterilizer having endless conveyors each cooperating with a respective pair of vertically spaced material receiving trays. Each of the material receiving trays comprises a plurality of tray sections. The conveyor includes a pair of conveyor chains disposed adjacent the opposite side of the trays and having a plurality of agitator elements fixedly secured to and extending between the chains, whereby the agitator element on the upper reach of the conveyor move longitudinally along the upper surface of the upper tray and the agitator elements on the lower reach more longitudinally along the upper surface of the lower tray. The agitator elements are alternatingly disposed above and below the reachs of the chains to which they are attached, ones of the elements pushing the material along the upper surfaces of the trays, causing an agitating or tumbling action of the material and alternative ones of the elements leveling the material on the tray. Hydrocarbon fuel fired burners are coupled to individual combustion chambers between which are interleaved the trays. The combustion chambers are located in stacked relationship adjacent one end of the trays for heating the tray located thereabove and carrying of vapor from the tray located therebelow. Bladed devices are disposed adjacent the discharge end of several of the trays for breaking apart caked drying material as it falls from tray to tray.

3,697,057

Patent Not Issued For This Number

3,697,058

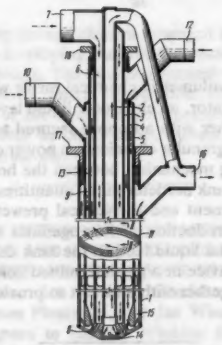
OXYGEN TOYERE OF A STEEL-MELTING MILL

Boris Semenovich Chaikin, Moscow; Lev Ivanovich Kozlov, Khimki Moskovsko oblasti; Thomas Vasilievich Malchenko; Konstantin Dmitrievich Mokrushin, both of Cherepovets Vologodskoi; Lev Volfovich Yarovsky, Moscow; Grigory Efimovich Maryanchik, Moscow; Boris Stepanovich Zhelnov, Moscow; Vasily Mikhailovich Tarasov, Moscow; Kirill Mikhailovich Trubetskov, Moscow; Igor Konstantinovich Borschevsky, Moscow, and Dmitry Pavlovich Chermensky, Vidnoe Moskovskoi oblasti, all of U.S.S.R., assignors to Gosudarstvenny Sojuzny Institut Po Proektirovanijuagregatov Staleliteinogo I Prokatnogo Proizvodstva Dlya Chernoi Metallurgii, Moscow, U.S.S.R.

Filed Feb. 2, 1971, Ser. No. 111,926

Int. Cl. C21c 7/00

U.S. Cl. 266—34 L **1 Claim**



The present invention relates to an oxygen tuyere of a steel-melting mill, whose body has pipes for supplying oxygen, a cooling medium and a shielding gas, coaxially arranged therein. The lower portion of the body of the tuyere has nozzles for supplying oxygen into liquid metal and slot-like noz-

zles for supplying a shielding gas, disposed above the former ones and forming a spiral, at least, a double-turn one, which embraces the body along its periphery.

3,697,059

HELICAL SPRING FOR PRODUCING ARTIFICIAL REVERBERATION

Werner Fidi, Baden near Vienna, Austria, assignor to Akustische U. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria

Filed Aug. 10, 1970, Ser. No. 62,442
Claims priority, application Austria, Aug. 19, 1969, 7934/69
Int. Cl. F16f *1/34*
U.S. Cl. 267—161 10 Claims

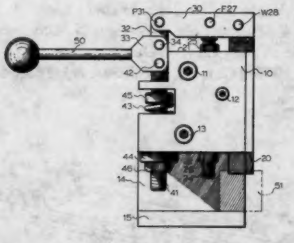
A helical spring for producing artificial reverberation, with the frequencies to be reverberated being impressed thereon in the form of torsional vibrations, has individual turns, at random locations therealong, deformed irregularly from a normally circular configuration. Portions of the deformed turns may be deformed outwardly from the normally circular configuration or deformed inwardly therefrom, or in both directions, but in the plane of the circular configuration.

3,697,060

ADJUSTABLE HEIGHT AND VARIABLE FORCE CLAMP

Walter A. Kulson, 30034 Paul Court, Warren, Mich.

Filed May 20, 1971, Ser. No. 145,260
Int. Cl. B25b *1/14, 5/12*
U.S. Cl. 269—228 5 Claims



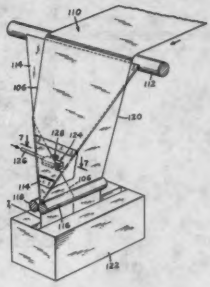
A quick-acting, spring-pressed clamp adjustable for spring compression clamping force having a body with a lever fulcrummed on a pillar which is heightwise adjustable. A post on the body is also heightwise adjustable for compensating for the adjusted height of the pillar fulcrum point. Thus height adjustment of the post and pillar adjust the height of the lever. A clamp jaw is connected to the weight end of the lever with the jaw thereby being height opening adjustable relative to a workpiece. The post pivotally supports a toggle knee block which is connected by link to the power end of the lever. The knee block is actuated by a handle. A spring supported on the body surrounds the post and an adjustment nut on the body supports the post on the spring. An opposing nut on the post opposes the adjustment nut on the post so that the spring may be pre-compressed under load therebetween to adjust the clamping force as desired without changing the adjusted height of the jaw relative to a workpiece in its open position and without interference in its clamped position.

3,697,061

METHOD AND APPARATUS FOR MAKING TWELVE-PAGE BOOKLETS OR SIGNATURES

Sidney V. Levine, 1 Skibo Lane, Mamaroneck, N.Y., and Christopher Hastalis, 1338 Leonard Way, North Valley Stream, N.Y.

Filed March 24, 1971, Ser. No. 127,595
Int. Cl. B41f *13/58*
U.S. Cl. 270—5 7 Claims



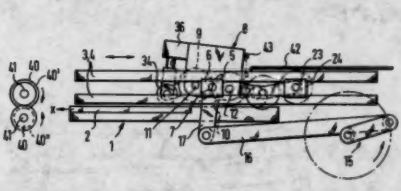
Method and apparatus for use with a web printing press and associated conventional folding devices for the continuous production from a single web of 12 page pasted booklets or signatures instead of or in addition to the eight page, or multiples thereof, booklets or signatures, pasted or not, which are customarily produced on web press and folder combinations. The apparatus constitutes a device for applying a thin continuous line of adhesive to both opposing surfaces of the printed web with said lines of adhesive extending lengthwise of and lying very close to a free edge of the web as it progresses from the press rolls to the first unit of the folding apparatus. The edge with applied adhesive is then folded into the interior of the 12 page assembly so as to bind all pages of the same firmly together.

3,697,062

MACHINE FOR THE ZIGZAG FOLDING OF SHEETS

Harri Mones, Am Marktweg 4, D-5601 Gruiten, and Walter Mones, Breidenhoferstrasse 30, D-5657 Haan, both of Germany

Filed Dec. 3, 1969, Ser. No. 881,818
Claims priority, application Germany, Dec. 4, 1968, P 18 12 557.0
Int. Cl. B65h *29/46*
U.S. Cl. 270—30 4 Claims



A machine is used for the zigzag folding of sheets, particularly paper sheets, in predetermined sizes. The machine has a table carrying the sheets to be folded and a carriage reciprocating above the table. A swing carried by the carriage carries a driven pair of folding rollers which are actuated in such manner that when the carriage moves forwardly one of

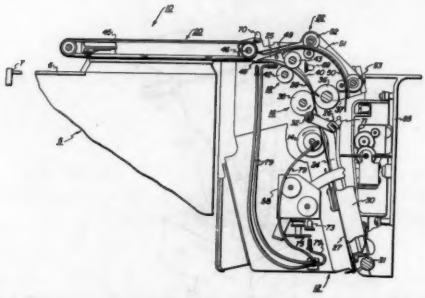
the rollers table against the ta and when the carriage moves rearwardly the other one of the rollers presses against the table.

3,697,063

DOCUMENT HANDLING APPARATUS

Stephen J. Greenfield, Fairport; Anthony Howard, Henrietta, and Lowell W. Knapp, Victor, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1970, Ser. No. 101,565
Int. Cl. B65h 3/06
U.S. Cl. 271—4 3 Claims



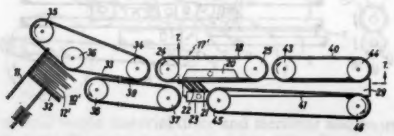
A document handling apparatus of the type in which documents are fed one by one from a document supply station to a work station and returned to the supply station for either recycling or removal. The apparatus incorporates a tray for holding the documents, feed means for feeding documents one by one from the bottom of the tray to the work station and back to the tray, a bail bar interposable above the tray to maintain documents returning to the tray segregated from documents awaiting feeding, and a cover for the tray. An operating control system for the document handling apparatus is provided, with light responsive detectors disposed at strategic points within the apparatus confines to trace movement of the documents. To provide light for the various detectors while facilitating repair and replacement of the light without the need to resort to substantial disassembly of the apparatus, a central light source is provided, there being individual fiber optic type light conductors to lead the light into an operative position opposite each detector.

3,697,064

APPARATUS FOR PRODUCING AN ORDERLY STACK OF FLAT ITEMS

Karl-Heinz Kummerer, Konstanz, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany

Filed Dec. 2, 1969, Ser. No. 881,368
Int. Cl. B65h 3/12, 31/06
U.S. Cl. 271—5 6 Claims



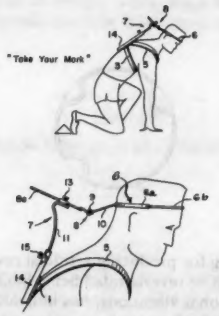
An arrangement for producing an orderly stack of items from a conveyed flow of flat items arriving in irregular amounts and overlapping one another, such as mail shipments, the arrangement including a pass-through separator and a stacker disposed in the conveying path behind the separator, the pass-through separator and the stacker being disposed with respect to one another in such a manner that the suction trough of the separator and the stack formed in the stacker are disposed on respectively opposite sides of the conveying path defined by the items passing from the separator to the stacker.

3,697,065

TRAINING AID FOR SPRINTERS

Thomas M. Glassburner, Jr., 1008 Westover Ave., Apt. 2-B, Norfolk, Va.

Filed Jan. 12, 1971, Ser. No. 105,800
Int. Cl. A63b 69/00
U.S. Cl. 272—59 R 5 Claims



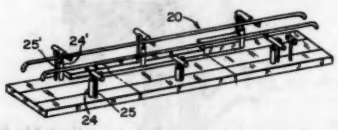
A training aid for maintaining the body of a runner in a proper sprinting form from start to finish during a race. The apparatus includes base plate means adapted for connection with the torso of the sprinter, head engaging means for engaging the sprinter's head, and connecting means for coupling the head engaging means with the base plate means so as to maintain the head and neck of the runner in an extended forward position relative to the torso during sprinting.

3,697,066

MOTORIZED PARALLEL BAR DEVICE MANUFACTURED IN VARIOUS LENGTHS

Roman G. Wieland, A. John Weber, Clair A. Bearfield and Gordon E. Nelson, all of Valley, N. Dak., assignor to Tri W-G, Inc., Valley City, N. Dak.

Filed Oct. 22, 1968, Ser. No. 769,643
Int. Cl. A63b 3/00
U.S. Cl. 272—63 4 Claims



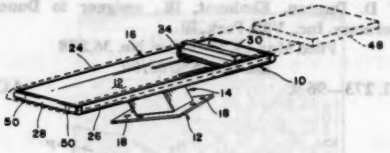
The invention comprises a motorized parallel bar device, having a pair of parallel bars. Each parallel bar is made in sections. A platform supports the bars and the platform is made in corresponding sections. A pair of vertically telescoping columns are mounted on each section to raise and lower the parallel bars, and telescoping drive shafts are on each platform section for moving the parallel bars horizontally. A reversable motor is mounted to one of the platform sections, and transmission shafts extend along the platform to transmit power to the telescoping columns and telescoping drive shafts. The transmission shafts are also made in sections corresponding to the platform sections and sleeves couple the shaft sections together and the parallel bar sections are coupled together.

3,697,067

CANTILEVER STAND

Carl R. Meyer, West Covina, Calif., assignor to Aquaslide 'n' DIVE CORPORATION, South El Monte, Calif.

Filed Jan. 17, 1969, Ser. No. 791,886
Int. Cl. A63b 5/10
U.S. Cl. 272—66 5 Claims



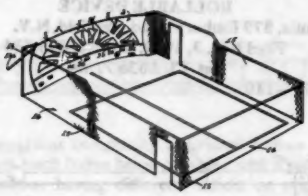
The invention provides a cantilever stand for diving boards. A diamond shaped tubular column is employed having a base at its lower end and a platform supported on its upper end and having means for anchoring the diving board at its butt end. A movable fulcrum is carried on the platform for selectively changing the fulcrum point of the diving board as desired. For higher stands, a step is provided.

3,697,068

NON-PLANAR BALL REBOUND WALL

Julia P. McDougall, Transvaal, Republic of South Africa, assignor to Tranly Walls and Mini Courts (Proprietary) Limited, Johannesburg, Transval, Republic of South Africa

Filed Sept. 9, 1969, Ser. No. 856,292
Claims priority, application South Africa, Sept. 18, 1968, 68/6047; June 27, 1969, 69/4579
Int. Cl. A63b 61/00
U.S. Cl. 273—29 A 7 Claims



A wall structure for practicing tennis or similar games. The structure provides a rebound surface which is non-planar so that rebound characteristics are obtained which differ from those of a conventional flat practice wall. In particular the rebound surface defines a generally concave configuration coupled with indented or projecting formations so that generally a ball rebounds towards a center line of the wall but an unexpected bounce is obtained when the ball strikes a formation.

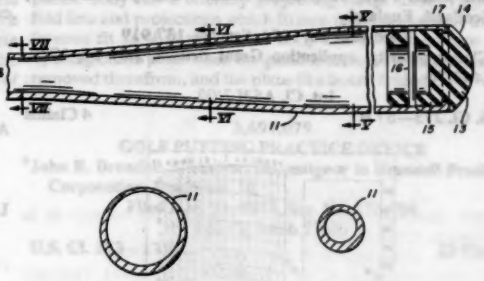
3,697,069

BALL BAT WITH ECCENTRICALLY THICKENED WALLS

Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1970, Ser. No. 88,916
Int. Cl. A63b 59/06
U.S. Cl. 273—72 8 Claims

This invention relates to ball bats and particularly to a bat with a tubular metal body wherein the wall thickness of the tube is eccentric to present a stronger ball striking area when the bat is properly oriented.



3,697,070

METALLIZING COATING COMPOSITIONS

Walter R. McAdow, Grosse Pointe Farms, Mich., assignor to Mobil Oil Corporation

Continuation-in-part of Ser. No. 33,106, April 29, 1970. This application June 19, 1970, Ser. No. 47,881
Int. Cl. C09c 1/62, 1/64
U.S. Cl. 106—291 7 Claims

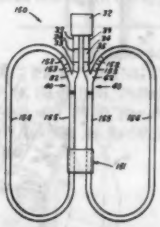
Metallizing coating compositions having greater sparkle and glitter are formed by including in the coating composition insoluble resin-supported planar reflective metal flakes in an amount of from about 0.0003 percent to about 0.035 percent of metal (particularly aluminum) based on the weight of the composition. The flakes are supported and rendered more planar by using a metal film surfaced on both sides with a relatively insoluble resinous film having a thickness of at least 0.01 mil. When the supported metal film is broken up to form flakes, the flakes are flatter and reflect light over a larger portion of their surface to permit use in smaller amount.

3,697,071

FLUID ACTUATED TRACK SYSTEM WITH CONSTANT FLOW VALVE

John E. Anderson, 217 Sesame Drive, Mesquite, Tex.

Filed Nov. 10, 1969, Ser. No. 875,212
Int. Cl. A63f 9/14; B65g 51/04
U.S. Cl. 273—86 D 12 Claims



A toy system having transparent conduit forming a track for projectiles such as toy trains propelled by air or water. A constant flow-type valve admits the fluid from a source of air or water under pressure controlling the rate of fluid admission to the conduit track to control the speed of the projectile along the track. The track is arranged in various configurations including closed loops and parallel straight drag strips. Indicating devices are included for counting the laps traversed by projectiles on the closed tracks and for indicating a winner in the drag strip arrangement.

3,697,072

GOLF BOARD GAME

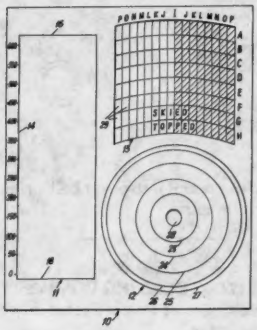
James Millar Park, 12 Coltness Road, Wishaw, Lanarkshire, Scotland, England

Filed June 29, 1971, Ser. No. 157,919

Claims priority, application Great Britain, July 16, 1970, 34,445/70

Int. Cl. A63f 7/00

U.S. Cl. 273—87 H 4 Claims



A board game based on golf comprises a board, a chart representing distances allied to different golf clubs, a distance and direction indicator, counters, markers representative of golf balls, and parts representative of arbitrary features of a hole on a golf course. The board includes first section devoted to the construction of a golf hole using said parts, and a second section which includes a grid comprising rows and columns of cavities referenced, respectively, in conformity with said chart and with an arcuate scale on said indicator, and spaned from said grid a target with concentric circles about a central cavity and from which counters can be flipped into cavities of said grid.

3,697,073

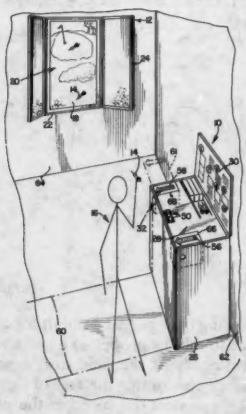
GOLF PHOTOGRAPHY DART BOARD GAME INCLUDING SCENE CHANGING MEANS

John F. Dooley, 212 Water Street, Janesville, Wis.

Filed May 21, 1969, Ser. No. 826,608

Int. Cl. A63b 71/04

U.S. Cl. 273—95 R 6 Claims



Apparatus for and method of projecting on a screen, views of different phases of a game, such as views of the fairways of the golf course, onto which darts may be thrown for representing distances of drive of the ball, and including overlay projections for indicating on the screen what the drive distances are as indicated by the landing positions of the darts, and arrows indicating the positions of the players for the next throw according to the position of the darts in previous plays.

3,697,074

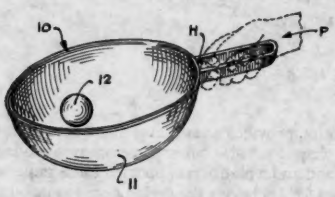
CATCHER AND PROJECTOR EMPLOYED WITH A SUBSTANTIALLY NON-RESILIENT BALL

Alfred D. Duncan, Elmhurst, Ill., assignor to Duncanlite Laboratory, Inc., Villa Park, Ill.

Filed May 13, 1970, Ser. No. 36,878

Int. Cl. A63b 63/00

U.S. Cl. 273—96 R 4 Claims



A game and equipment therefor, including a hand manipulated launcher and a ball, in which the ball is impelled along a trajectory by first placing the ball on a reaction surface presented by the launcher, rocking the launcher to impart momentum to the ball and then withdrawing the launching surface by swift movement so that the ball is launched on its trajectory by reaction, whereafter a gamesman endeavors to catch the ball by a launcher used in the game. The reaction surface is an arc of no more than 180°, and preferably about 160°. The ball is to be caught or captured in such a fashion that the ball does not bounce or ricochet into an ungoverned trajectory.

3,697,075

SWINGABLE GUIDEWAYS FOR PROPELLING A ROLLABLE DEVICE

John J. Nania, 879 Embury Road, Penfield, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,534

Int. Cl. A63b 71/04

U.S. Cl. 273—110 3 Claims

A game including two vertically swingable guideways mounted on a common base. The players send a rolling device back and forth from one guideway to the other, each trying to drive the device over the end of his opponent's guideway and to stop the device just before it reaches the end of his own. The guideways may be of flexible material, but are preferably rigid, with detent means to limit their upward travel.

3,697,076

BOARD GAME APPARATUS

Charles B. Vogel, 5612 Wickersham, Houston, Tex.

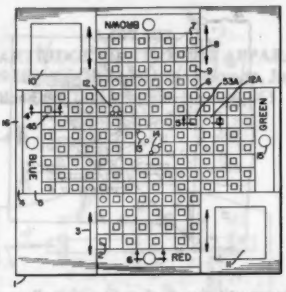
Continuation-in-part of Ser. No. 659,627, Aug. 10, 1967, Pat. No. 3,588,114. This application April 17, 1969, Ser. No. 817,116

Int. Cl. A63f 3/00

U.S. Cl. 273—131 A 15 Claims

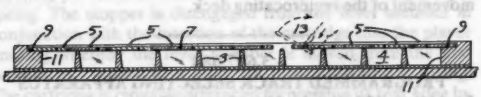
This board game apparatus comprises a board and playing pieces constructed so as to produce visual and audible indications in response to manipulation of the pieces during a game.

Attached to the board are sources of electrical energy, electrical indicators, switches and patterns of electrodes which are repeated at board positions occupied by the pieces. These electrical components are connected so as to form incomplete circuits. The playing pieces bear hidden electrodes which cooperate with the other electrical components to complete one of the circuits and actuate one of the indicators when the pieces occupy certain combinations of positions. Certain of



the pieces are symmetrical and can be placed upon the board in either of two visually indistinguishable orientations ; the hidden electrodes then cooperate with the patterns only if the pieces are suitably oriented. Certain other pieces are provided in pairs having identical outward appearance but different internal structures. One piece of a pair then cooperates with the patterns while the other does not. Still other pieces are provided which have no electrodes but bear concealed indicators responsive to mechanical energy supplied by the players.

3,697,077
BOARD GAME APPARATUS
Stanley D. Palmer, 1810 Empire, Joplin, Mo.
Filed June 15, 1970, Ser. No. 46,162
Int. Cl. A63f 3/00
U.S. Cl. 273—135 B **2 Claims**

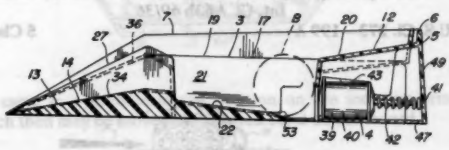


Game apparatus comprising individual frames for two or more players, each frame being provided with a plurality of invertible sections having different indicia on opposite sides susceptible of section combination to form contrasting panoramas of desired and undesired scenes, and dice for directing reversing of player-selected sections to complete a panorama.

3,697,078
FOLDABLE GAME PLAYING BOARD
Harald Riehle, Esslingen/Neckar, Germany, assignor to IWA-Rechenschieberfabrik F. Riehle KG, Esslingen/Neckar, Germany
Filed March 4, 1971, Ser. No. 121,107
Int. Cl. A63f 3/00
U.S. Cl. 273—136 G **5 Claims**

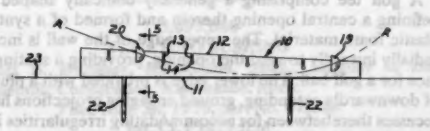
To reduce the packing space of game playing boards, which are formed with depressions to place game chips or the like therein, a plate member is formed with a preferably central opening into which a plastic body can be inserted. The plastic body has the depressions therein into which the chips can be placed. The plate member itself is formed with a fold line. The plastic body has a laterally projecting flange underlying the fold line and projections which fit into openings with an interference fit so that the plastic body can be pushed into the opening of the plate when the game is to be played, and can be removed therefrom, and the plate-like board folded.

3,697,079
GOLF PUTTING PRACTICE DEVICE
John R. Brandell, Glenview, Ill., assignor to Brandell Products Corporation, Rosemont, Ill.
Filed Aug. 23, 1971, Ser. No. 173,794
Int. Cl. A63b 57/00
U.S. Cl. 273—179 A **23 Claims**



A golf putting practice device embodying a ball receiving pocket simulating an actual putting cup and operable to kick a ball received in the device back to the person making a putt. The device includes a front ramp having a central portion which rises to a lesser height and at a lesser slope than the portions on either side thereof. A second ramp slopes rearwardly and downwardly from the front ramp to a floor area including a pocket which simulates a putting cup. The floor area around the pocket is inclined so that all balls thereon will roll into the pocket. The rear wall of the pocket remote from the front ramp may include a concave depression straddled by two flanges which together provide a recess for receiving a golf ball to be ejected from the pocket. The ejection device may be a solenoid including a coil and a plunger held in a retracted position by a compression coil spring. The ejection device is actuated when the ball engages a plunger type switch which may be located in the depression in the rear wall of the pocket. The central portions of the front and rear ramps are straddled by upstanding ribs which may guide a properly putted ball into the pocket. Additional upstanding guiding ribs are provided on the side portions of the front ramp and the floor of the pocket. The bottom surface of the pocket slopes downwardly and rearwardly so that any ball thereon is caused to roll rearward to the ejection device. An inclined portion of the pocket's bottom surface adjacent the ejection device is so sloped that an ejected ball is caused to engage same and be thrown forwardly over the top of the front ramp.

3,697,080
GOLF PRACTICING DEVICE
Alfonso L. Liotta, P.O. Box 2066, Pullman, Wash.
Filed Aug. 20, 1970, Ser. No. 65,577
Int. Cl. A63b 69/36
U.S. Cl. 273—186 R **1 Claim**



A longitudinally elongated upright support member made of wood or other suitable material includes a planar lower surface adapted to be secured to the supporting surface for a practicing golfer. The upper inclined longitudinal surface of the member has a plurality of vertical transversely-directed

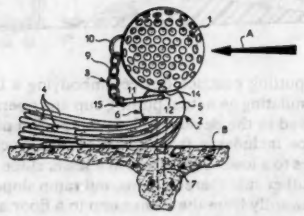
slots formed through it at differing elevations, the slots being longitudinally spaced from one another. First and second transverse flexible tabs are seated within selected slots and extend outwardly from the members beyond a common side of it. Simulated golf ball surfaces are integrally formed at the outer end of each tab, the center of one such surface being located above the plane of the lower surface of the member by a distance greater than the corresponding distance between the plane of the lower surface and the center of the remaining golf ball surface.

3,697,081

DEVICE FOR GOLF TRAINING

Marie Alexandre Jacques Louis Peyroux, 22, avenue de la Grande Armee, 17-Paris 17°, France

Filed March 18, 1971, Ser. No. 125,746
Claims priority, application France, Feb. 17, 1971, 7105353
Int. Cl. A63b 69/36
U.S. Cl. 273—199 A 5 Claims



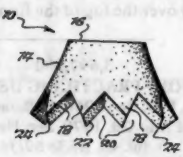
The invention relates to a device for golf training including a standard golf ball and an aerodynamic braking member secured thereto by means of a flexible tie, said braking member having incorporated therein a substantially rigid support member with a head integral therewith, which head is adapted to receive said golf ball before hitting the same.

3,697,082

GOLF TEE

Arnold E. Di Laura, 414 Brisbane Building, Buffalo, N.Y., and Donald P. Pratt, 3083 Schoolview Road, Eden, N.Y., assignors to said Di Laura, by said Pratt

Filed Aug. 29, 1969, Ser. No. 854,137
Int. Cl. A63b 57/00
U.S. Cl. 273—205 1 Claim



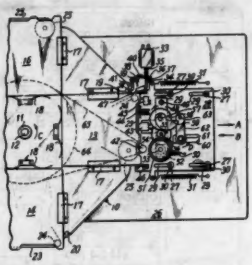
A golf tee comprising a generally conically shaped wall defining a central opening therein and formed of a synthetic plastic foam material. The upper edge of the wall is inclined radially inwardly toward the opening, providing a seating surface for a golf ball. The lower edge is provided with a plurality of downwardly extending, ground engaging projections having recesses therebetween for accommodating irregularities in the ground surface. The tee is formed by stamping out an arcuately shaped section from a flat strip of synthetic plastic foam material with the cut edges extending normal to the plane of the section. The opposite ends of the section are brought together and secured to form the generally conically shaped tee.

3,697,083

TAPE PLAYER UTILIZING PLURALITY OF ENDLESS MAGNETIC TAPE CARTRIDGES

Itsuki Ban, 829 Higashi-Oizumimachi, Tokyo-to, Japan

Filed Jan. 19, 1970, Ser. No. 3,916
Claims priority, application Japan, Jan. 22, 1969, 44/4059
Int. Cl. G11b 23/12, 23/06
U.S. Cl. 274—4 F 8 Claims



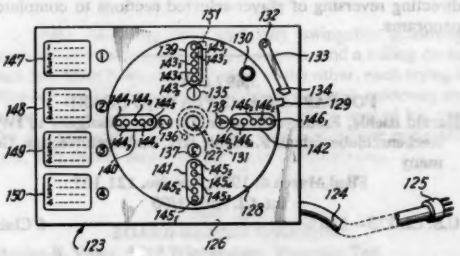
A tape player utilizing a plurality of endless magnetic tape cartridges, comprising a rotatable container accommodating the plurality of endless magnetic tape cartridges, a container latch means for arresting rotation of the container to position the cartridge to be played in a predetermined position, a swingable reciprocating deck provided with a capstan and a reproducing member for playing the cartridge held in the playing position such as a magnetic head or the like, a deck latch means for retaining the reciprocating deck at a position where the cartridge in the playing position is played, a tension spring for moving the reciprocating deck which has been released from the deck latch means to the direction away from the cartridge, a deck moving means moving the cartridge to a position where it is played by rotation of the capstan against the bias of the tension spring, and a means for positioning another cartridge in the playing position by rotation of the capstan while the deck is being moved by the deck moving means to a position where the cartridge is played whereby the cartridge is suitably played by controlling rotation of the container and movement of the reciprocating deck.

3,697,084

PROGRAMMED TRACK SELECTING APPARATUS

Itsuki Ban, 829 Higashi-Oizumimachi, Tokyo-to, Japan

Filed Jan. 21, 1970, Ser. No. 4,601
Claims priority, application Japan, Jan. 22, 1969, 44/4060
Int. Cl. G11b 23/06, 23/08
U.S. Cl. 274—4 F 3 Claims



A programmed track selecting apparatus for a multiple tape cartridge player utilizing a plurality of multi track endless magnetic tape cartridges, has a plurality of track selecting switches for designating a desired track to be played mounted below an assignment plate that rotates at a rotational speed less than that of the container carrying the cartridges. The as-

signment plate carries a plurality of pushbutton rods associated with each cartridge operable when manually depressed to actuate the track selecting switch. The track selecting switches cooperate with a rotary switch having a second set of switches corresponding to the track selecting switches, the rotary switch being rotated in synchronism with the container and operable to actuate a rotary cam to move the magnetic head across the tracks on the tape to the desired track.

3,697,085

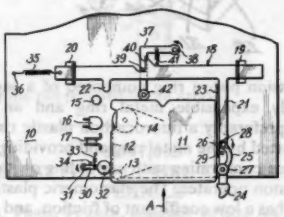
TAPE CARTRIDGE POSITIONING APPARATUS

Itsuki Ban, 829 Higoshi-Oizumimochi, Tokyo-to, Japan

Filed Dec. 22, 1970, Ser. No. 100,561

Int. Cl. G11b *23/04*

U.S. Cl. 274—4 B **8 Claims**



A tape cartridge positioning apparatus for an endless magnetic tape cartridge player, which comprises a reciprocating lever member slidably provided on a deck in a player so as to be transverse to a direction that the tape cartridge is laterally inserted into the player housing and adapted to be urged by a tension spring in one direction, a stopper means retaining the lever member in a first portion where the cartridge to be inserted into the player housing is interposed between a rear arm parallel with a front arm on the lever member, a first guide member movably provided on the lever member and adapted to be urged by a spring, and a second guide member movably provided on the deck and adapted to be urged by a spring. The stopper is disengaged from the lever member in conjunction with the insertion of the cartridge into the player housing whereby the lever member is moved from the first position to a second position by the bias of the tension spring. The cartridge is movably advanced by pressing its rear edge by the rear arm when the lever member is moved to the second position. The first and second guide members serve to guide the cartridge when inserted into the player housing and to press the side wall of the cartridge under influence of the springs when moved to the play position thereby positioning the same in the play position in association with the lever member.

3,697,086

PHONOGRAPH INDEX MEANS

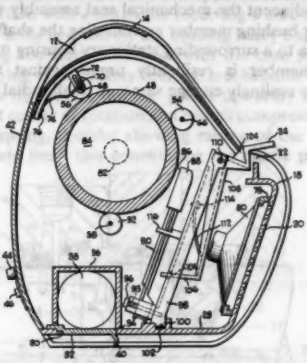
Gunars Licitis, Lombard, Ill., assignor to Marvin Glass & Associates, a partnership

Filed Feb. 8, 1971, Ser. No. 113,299

Int. Cl. G11b *17/06*

U.S. Cl. 274—17 **6 Claims**

Apparatus for indexing a stylus relative to any of a plurality of recording bands on a record. The apparatus includes an elongated tone arm mounting a stylus and which is received in a bridge on an indexing arm movably mounted for indexing relative to a record. The tone arm is connected to the indexing arm by means of a connection which permits pivotal movement of the tone arm relative to the indexing arm and cocking of the tone arm relative to the indexing arm. A spring is provided to bias the tone arm about the connection in such a way that the stylus of the same will be in contact with the record and a manual operator is provided and connected to the indexing arm such that upon movement of the same, the tone arm will be cocked about the connection and pivoted about



the same to a predetermined position on the indexing arm which then may be moved to a desired band on the record.

3,697,087

AUTOMATIC RECORD PLAYER

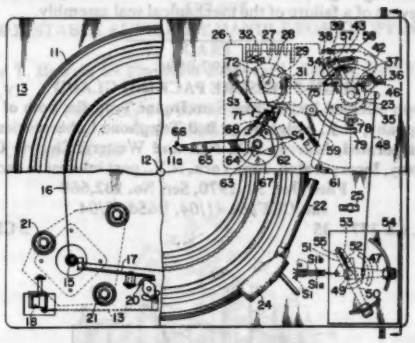
Yoshio Takahashi, Yokohama-shi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 12, 1969, Ser. No. 875,683

Claims priority, application Japan, Nov. 13, 1968, 43/82540; July 3, 1969, 44/52588

Int. Cl. G11b *3/10, 17/08*

U.S. Cl. 274—23 R **7 Claims**



An automatic record player controlling automatically a tone arm to reproduce a record disk which can be of various diameters. The tone arm is moved from an arm rest onto a record to reproduce the record and is returned from the record to the arm rest when the record is reproduced either completely or only halfway. The tone arm of the automatic record player can also be controlled manually.

3,697,088

FLOATING BUSHING

Herbert B. Hummer, Kalamazoo, Mich., assignor to Duametallic Corporation, Kalamazoo, Mich.

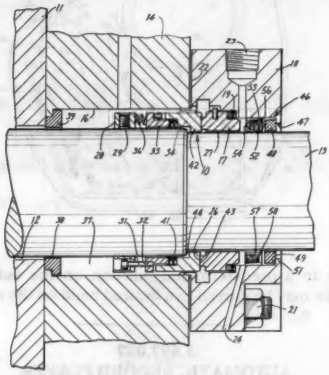
Filed Aug. 28, 1970, Ser. No. 67,846

Int. Cl. F16J *15/38*

U.S. Cl. 277—9 **6 Claims**

A mechanical seal construction for use between a wall and a shaft extending therethrough and rotatable relative to the wall. The seal construction includes a conventional mechanical seal assembly having a pair of seal members with mutually contacting seal faces thereon, one seal member being fixed

with respect to the wall and the other seal member being capable of rotation with the shaft. A floatable bushing assembly is disposed adjacent the mechanical seal assembly and includes an annular bushing member surrounding the shaft and floatable relative to a surrounding stationary housing member. The bushing member is resiliently urged against the housing member to sealingly engage same. A small radial clearance is



provided between the bushing member and the shaft to permit relative rotation therebetween whereas the bushing is free to radially float in response to deflection or whip of the shaft. The floating bushing assembly is disposed outwardly from the mechanical seal assembly to act as a safety or back-up for preventing large quantities of fluid from suddently escaping in the event of a failure of the mechanical seal assembly.

3,697,089

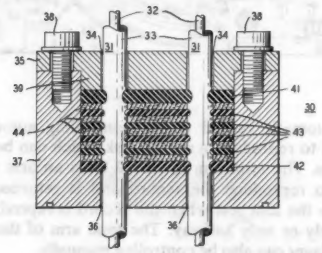
HIGH-PRESSURE PACKING GLAND

Joseph Michael Jacisin, and Sam Duane Tropello, both of Parsippany, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Incorporated, New York, N.Y., part interest to each

Filed Dec. 30, 1970, Ser. No. 102,668

Int. Cl. F16k *41/04*; B65d *53/04*

U.S. Cl. 277—35 **3 Claims**



A high-pressure packing gland adapted for surrounding a portion of a wire having an external polymeric covering. The packing gland comprises layers of viscoelastic material compressed around the covered wire for exerting a restraining frictional force thereon. This force is distributed at spaced intervals along the wire by layers of incompressible material interlocated between the layers of viscoelastic material thus forming a series of annular indentations in the polymeric covering for increasing the restraining effect. An additional layer of viscoelastic material has a different characteristic which causes it to form a deeper annular indentation for impeding the extrusion of the polymeric covering.

3,697,090

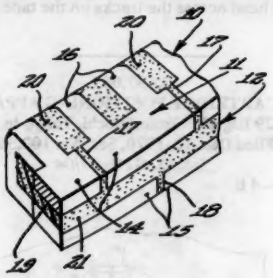
PLASTICS FILLED PISTON RING

Arthur M. Brenneke, New Castle, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed June 29, 1970, Ser. No. 50,677

Int. Cl. F16j *15/16*

U.S. Cl. 277—157 **12 Claims**



A compression piston ring composed of a segmented circumferentially expansible metal ring and an elastomeric plastic ring, preferably a fluorocarbon plastic ring, anchored to and supported by the metal ring and providing a peripheral sealing surface conforming with and riding on the cylinder in which the piston operates. The elastomeric plastic material is oil resistant, has a low coefficient of friction, and retains its integrity under the operating conditions existing in an internal combustion engine. The plastics material is preferably injected into the segmented metal ring to fill all voids of the metal ring, eliminating all gap leakage, and insuring low blowby, minimized air pollution, and oil oxidation.

3,697,091

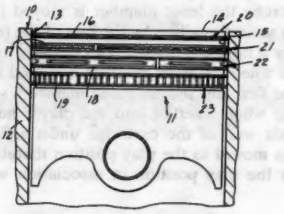
PISTON RING FACINGS

Herbert F. Prasse, Town and Country, and Harold E. McCormick, Ballwin, both of Mo., assignors to Ramsey Corporation, St. Louis, Mo.

Filed May 11, 1970, Ser. No. 36,143

Int. Cl. F16j *9/12*

U.S. Cl. 277—235 A **4 Claims**



This invention covers piston rings, including compression and oil control rings for internal combustion engine pistons, having a bearing face coated with a hard coating, particularly exhibiting good scuff-resistance comprising either a zirconium oxide base coating or a titanium oxide-aluminum oxide coating. The coating is preferably a plasma jet applied coating formed in situ on the bearing face.

3,697,092

EXPANDING ARBOR

Russell W. Anthony, Harper Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

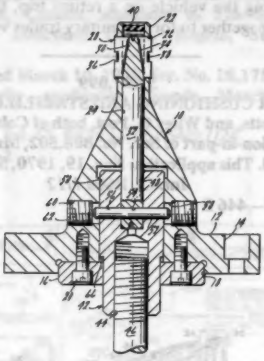
Filed March 23, 1971, Ser. No. 127,147

Int. Cl. B23b *31/40*

U.S. Cl. 279—4 **5 Claims**

An expanding arbor having a pin with cam slots receiving

expanding wedges and an adapter for effecting expanding



movement of the pin relative to the arbor.

3,697,093

ARRANGEMENT FOR SECURING A CONTAINER TO A VEHICLE

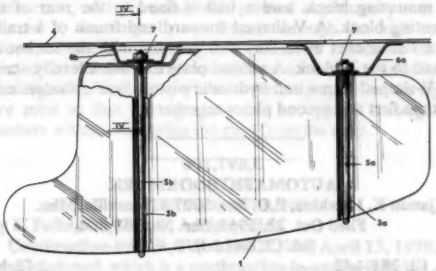
Sean Cadiou, Paris, France, assignor to Ste. An. Automobiles Citroen, Paris, France

Filed March 8, 1971, Ser. No. 121,878

Claims priority, application France, March 13, 1970, 7009234

Int. Cl. B60p *3/22*

U.S. Cl. 280—5 A **9 Claims**



A gasoline tank or like container is fastened to a vehicle, say to the lower surface of a floor-board, by means of yielding straps whose ends of which are secured to the floor-board or like support and engage in grooves formed in the side walls and bottom of the container in parallel vertical planes. The grooves form ribs along the inner surface of the container so as to partition partly the inside of the latter and have a depth which, measured vertically, decreases across the bottom of the container from the side wall towards the center of its bottom.

3,697,094

SAFETY BOOT BINDING FOR SKIS WITH TWO-STAGE RECOCKING

Georges P. J. Salomon, 34 de Loverchy Avenue, 74 Annecy, France

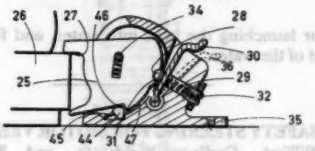
Filed Dec. 15, 1969, Ser. No. 885,304

Claims priority, application France, Dec. 16, 1968, 68178545

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 T **10 Claims**

A rear safety boot binding for skis with two-stage recocking requiring much less effort for recocking the binding. The boot heel retaining jaw has a slot accommodating a shaft and a spring abutting against the shaft and the end of the slot. The jaw forms a cam profile in its portion opposed to the boot heel receiving portion with a notch for receiving a stud or the like carried by a lever pivoted on the binding base, a spring constantly urging the stud in contact with the cam profile and being the spring of the safety locking mechanism. When the stud engages the notch, the jaw pivots upwardly about said stud as a first center of rotation and causes compression of the first-named spring, thereby allowing raising of the boot heel up to a certain limit, this constituting the elastic play of the



jaw. Upon additional raising of the boot heel, the first-named spring is completely compressed and the jaw pivots about the shaft, causing the safety locking mechanism to release the jaw, thereby resulting in the safety opening of the binding. During this release, the spring of the safety locking mechanism is compressed, thereby constituting the first recocking stage of the binding, while the second recocking stage occurs during downward closing movement of the jaw when a sector-shaped member causes upward movement of the jaw with consequent compression of the first-named spring.

3,697,095

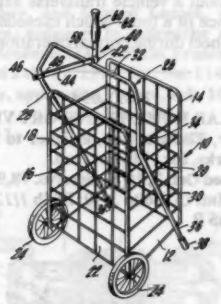
ADJUSTABLE AUXILIARY HANDLE FOR SHOPPING CART

Peter T. Howell, 69 Pinehurst Boulevard, Apt 3D, New York, N.Y.

Filed May 14, 1971, Ser. No. 143,402

Int. Cl. B62b *5/06*

U.S. Cl. 280—47.26 **3 Claims**



A shopping cart is provided with an adjustable handle which is movable transversely across the handle of the cart, to thereby facilitate movement of the cart in different orientations.

3,697,096

BOAT HANDLING APPARATUS

Floyd H. Hadley, 1534 Bluebell Drive, Livermore, Calif.

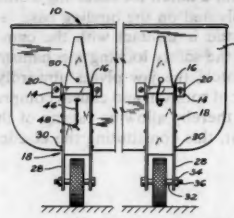
Filed June 25, 1970, Ser. No. 49,846

Int. Cl. B60p *3/10*

U.S. Cl. 280—47.32 **1 Claim**

Wheeled devices for rapid, easy, removable, attachment to

the transom of a boat, for maneuvering the boat about on



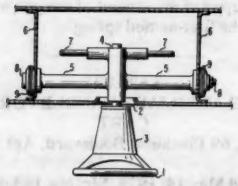
land, for launching the boat into water, and for pulling the boat out of the water.

3,697,097

SAFETY STEERING FOR MOTOR VEHICLES

Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Maichingen (Wurtt.), both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 26, 1969, Ser. No. 880,104
Claims priority, application Germany, Nov. 27, 1968, P 18 11 093.5
Int. Cl. B60r 21/02
U.S. Cl. 280—87 A 22 Claims



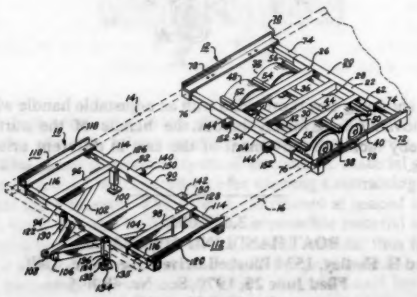
A safety steering arrangement for motor vehicles in which the steering wheel or a part carrying the steering wheel is so secured at the vehicle superstructure that a pivoting of the steering wheel about a vehicle transverse axis can take place under the influence of a force which exceeds the force acting on the steering wheel during normal operation.

3,697,098

MODULAR HOME TRANSPORT VEHICLE

Robert L. Fisher, Elkhart, Ind., assignor to Elkhart Welding and Boiler Works, Inc., Elkhart, Ind.

Filed Oct. 7, 1970, Ser. No. 78,901
Int. Cl. B60p 3/40; E04h 1/12
U.S. Cl. 280—415 R 9 Claims



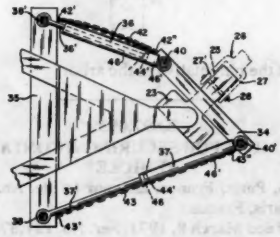
A modular home transport vehicle having a front section with a tongue and coupling means for connection with a tractive vehicle, and a second section having an undercarriage for transporting the module, the two sections are secured to the under side of a module in spaced relation to one another, and in transporting the vehicle on a return trip, the two sections are coupled together to form a unitary trailer vehicle.

3,697,099

TRAILER CUSHIONING AND STABILIZING DEVICE

Robert L. Potts, and Wiley G. Post, both of Columbus, N. Dak.

Continuation-in-part of Ser. No. 808,502, March 19, 1969, abandoned. This application Nov. 19, 1970, Ser. No. 90,911
Int. Cl. B60d 1/12
U.S. Cl. 280—446 B 4 Claims



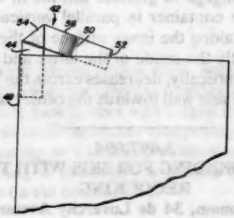
The invention comprises a trailer cushioning and stabilizing device having a T-shaped mounting block mounted to the rear of a towing vehicle. A horizontal plate is fixed laterally across the mounting block. and a ball is fixed to the rear of the mounting block. A V-shaped forward end frame of a trailer has a ball socket at its forwardmost end with the socket attached to the T-block. A second plate extends laterally across the V-shaped frame and hydraulic pistons and cylinders connect the first and second plates together.

3,697,100

AUTOMATIC BOOKMARK

Benjamin K. Hawkins, P.O. Box 5097, Greenville, Miss.

Filed Oct. 23, 1969, Ser. No. 868,804
Int. Cl. B42d 3/12, 9/00
U.S. Cl. 281—42 2 Claims

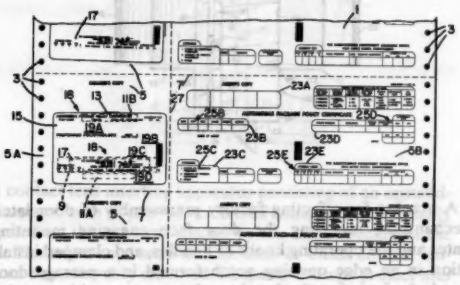


A bookmark made of a single blank of flexibly elastic sheet material having leg portions that extend from mounting arms at an acute angle. The leg portions are joined at a central fold and are received between the leaves of a book when the arms are adhesively bonded to the outside sheets or inside of the covers adjacent the back binding.

3,697,101
PRODUCTION OF DOCUMENTARY EVIDENCE

Edwin Loos, and James William Caudle, both of Regina, Saskatchewan, Canada, assignors to The Saskatchewan Government Insurance Office, Regina, Saskatchewan, Canada

Filed March 10, 1970, Ser. No. 18,175
Claims priority, application Canada, March 12, 1969, 045,452
Int. Cl. B42d *15/06*; B41l *1/26*
U.S. Cl. 283—62 6 Claims

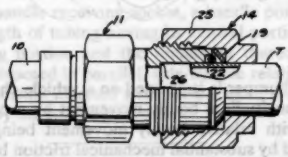


This specification relates to the production of policy certificates and separate records of individual policy details on a high speed printer. A roll of paper strip has printed on it at spaced locations along its length standardized text relating to the general form of insurance transaction. Plasticized cards each bearing printed information and provided with sensitized blank spaces for the addition of data peculiar to a given transaction, and provided with printed explanatory text are secured to the strip. In one transit through the high speed printer, all the data relating to a particular insurance data is printed out. Each card has a sensitized zone for a manually applied signature and an aperture in the strip opposite the signature zone so that the signature can be applied through the aperture without removing the card from the strip.

3,697,102
TUBING COUPLING

Jay F. Falke, P.O. Box C, Adrian, Mich.

Continuation-in-part of Ser. No. 27,706, April 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 850,908, Aug. 18, 1969, abandoned. This application Dec. 9, 1970, Ser. No. 96,411
Int. Cl. F16l *19/08*
U.S. Cl. 285—340 4 Claims

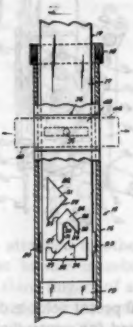


A refrigeration tubing coupling for connecting deformable tubing to a refrigeration unit or to another length of refrigeration tubing. The coupling comprises two bodies having openings therein. A deformable crimping member is interposed between the bodies and cooperating surfaces between the bodies are adapted to deform the crimping member and cause it to in turn deform an annular portion of the tubing upon axial movement of the bodies toward one another.

3,697,103
TELESCOPIC TUBE LOCKING AND UNLOCKING SYSTEM

William D. Mostyn, Canberra, Australia, assignor to The Government of the Commonwealth of Australia as represented by the Minister of State for Defense

Filed Nov. 3, 1970, Ser. No. 86,575
Int. Cl. E21d *15/16*
U.S. Cl. 287—58 CT 6 Claims

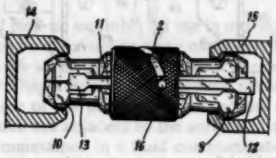


A telescopic tube locking and unlocking system in which one square tube is slidable within another square tube of larger diameter. The outer tube is provided with a transverse slot and a pin mounted in a slide which slides laterally in a guideway plate fixed to the wall of the outer tube. The pin extends through the slot to engage the edges of a series of vertically arranged and vertically spaced cams fixed to at least one wall of the inner tube. By pulling the tubes apart then pushing them together the pin cooperates with the cams to lock the inner tube in an extended position or permit telescoping thereof in the outer tube.

3,697,104
COUPLINGS FOR TOOLS AND SAFETY DEVICES USED IN OIL-WELLS

Guy Soulie, Billere, and Gerard Lozach, Neuilly-Plaisance, both of France, assignors to Entreprise de Recherches et d'Activities Petrolieres (ELF), Paris, France

Filed Feb. 11, 1971, Ser. No. 114,471
Claims priority, application France, Feb. 16, 1970, 7005350
Int. Cl. F16b *1/04*
U.S. Cl. 287—111 2 Claims

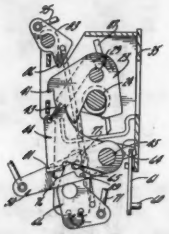


A coupling used to connect together two laying or safety devices used in oil-wells, consisting of a hollow cylindrical shell, with two spiral apertures, of the same pitch, cut in opposite sides of it, and containing two split cylindrical components, which cannot move lengthwise in relation to the shell, and which include a narrower section beyond each end of the shell, followed by a wider section with truncated shoulders and plane sides; two wedges fit inside these components, and can push them apart, lengthwise mobility of these wedges being provided by pins which fit into the spiral apertures.

3,697,105
LATCH FOR VEHICLE DOORS

Thomas O. Marx, Rockton, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Dec. 24, 1969, Ser. No. 887,917
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 8 Claims

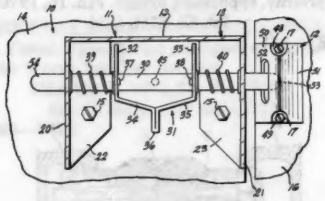


A free-wheeling, dual preset vehicle door latch with a force transmitting pin mounted for controlled floating within slots formed in a side-by-side contactor and locking lever. The latch is of the "impulse" type in that the second preset operation may be performed completely while the door is open so that the door may be closed and locked simply by being swung shut in a normal fashion. The latch is disposed within the door in a so-called "upside-down" manner in that the contactor and locking lever are disposed below the latching element to facilitate connecting the contactor and locking lever to the inside and outside release members and the inside and outside locking members of the door.

3,697,106
LIVESTOCK GATE LATCH

Ivan W. Meyer, Rural Route No. 1, Sherwood, Mich.

Filed Feb. 8, 1971, Ser. No. 113,231
Int. Cl. E05c *1/04*; E05b *15/02*
U.S. Cl. 292—175 9 Claims

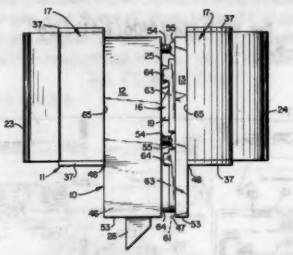


A latch is provided for use on gates to be particularly utilized on livestock enclosures. The latch comprises in combination a latching member and a keeper. The latching member comprises a housing having a latching bolt slidably mounted therein and spring loaded in extended position. A bracket is affixed to the bolt terminating in a finger hold, the bracket and finger hold being entirely recessed within the housing to prevent actuation by animals contained within the enclosure. In an improved version, both ends of the bolt extend out of the housing and the bolt is spring biased to a median position. The bolt may be moved in either direction from the center position by grasping the finger hold, thereby permitting the latch to be used either for right-hand opening or left-hand opening doors.

3,697,107
DOOR LOCK MOUNTING BRACKET

Walter Krantz, 42 South Meridian Road, Youngstown, Ohio

Filed Feb. 19, 1971, Ser. No. 116,824
Int. Cl. E05b *9/08*
U.S. Cl. 292—337 12 Claims

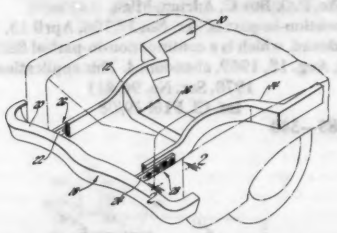


A bracket for effecting factory preassembly of door latch mechanisms, including the door face engaging mounting plates and the operating knobs or handles, and clamped installation in an edge opening notch formed in a passage door merely by inserting the bracket of the preassembly endwise into the door notch and threading home a single clamp screw and nut assembly provided to effect factory preassembly. The bracket is composed of a pair of shell-like castings respectively fixedly secured to the latch mechanism mounting plates and formed at their meeting edges to form a telescopic connection which fixedly orients the mounting plates, operating knobs or handles, and latch operating mechanism upon factory assembly.

3,697,108
ENERGY ABSORBING BUMPER MOUNT

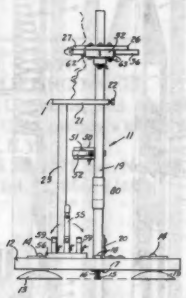
James H. Diener, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1971, Ser. No. 118,703
Int. Cl. B60r *19/04*
U.S. Cl. 293—89 3 Claims



A collision bumper is supported on a vehicle chassis frame for relative longitudinal bodily movement by a pin and slot connection with relative bodily movement being normally rigidly resisted by substantial mechanical friction between the bumper and the chassis frame. A metal strap formed with a single convolution is connected at one end to the bumper and at the other end to the chassis frame. When an impact on the bumper results in a force on the latter of extraordinary magnitude, the frictional resistance to relative bodily movement is overcome and the bumper is forced rearwardly against the friction to effect primary energy absorption. Simultaneously, tensile forces exerted by the bumper on the strap initiate localized plastic deformation thereof to effect secondary energy absorption.

3,697,109
CONTACT LENS INSERTER
Ottis L. Parrent, 368 East 64th Avenue, Hialeah, Fla.
Filed March 30, 1971, Ser. No. 129,361
Int. Cl. G02c 11/00
U.S. Cl. 294—1 CA 12 Claims



A contact lens inserting apparatus consisting of an upstanding support with a pair of horizontal parallel tubes slidably mounted on the support, spaced by the same spacing as the eyes. The tubes have seats at their ends in which contact lenses can be removably mounted. Respective lamps project into slots in the tubes and are energized from a source of current carried by the support. A chin rest is provided subjacent the tubes. The tubes can be manually moved longitudinally by the user to place the lenses in his eyes while his chin is supported on the chin rest.

3,697,110
TOOL HANDLE CONSTRUCTION
William E. Portz, Geneva, and Harry B. Stump, Ashtabula, both of Ohio, assignors to True Temper Corporation, Cleveland, Ohio
Filed Oct. 15, 1968, Ser. No. 768,203The portion of the term of this patent subsequent to July 15, 1983, has been disclaimed.
Int. Cl. B25g 3/26
U.S. Cl. 294—57 14 Claims

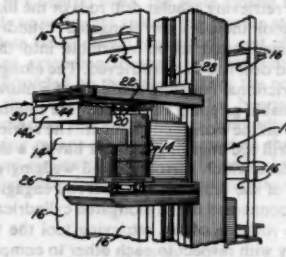
There is disclosed herein a shovel comprising a blade portion having a handle receiving socket, a handle portion made of a single length of tubing having its central portion formed into a gripping portion and the remainder thereof brought together and disposed in parallel, side-by-side relation to provide a shank portion inserted within the socket, and a plastic insert carried by the gripping portion.

3,697,111
SOAP BAR ATTACHMENT DEVICE
Bernard C. Thompson, 3245 West Altadena Ave., Phoenix, Ariz., assignor to William P. Sherman, Dayton, Ohio, a part interest
Filed Jan. 4, 1971, Ser. No. 103,621
Int. Cl. A47g 35/00; A47k 5/00
U.S. Cl. 294—64 10 Claims

A soap bar is attached to a resilient suction cup having a pointed stud which projects from the face of the cup and penetrates the bar to prevent relative sliding movement. The suction cup may be mounted on a spool-like member having a base portion adapted to rest on a sink-top and connected by a neck portion to a tapering flange portion defining a soap dish.

The suction cup may be attached to other elements for support or use thereby. The handle member is adapted to fit between the second and third fingers of a person's hand, and the suction cup may incorporate integral flute-like teeth for shaving the soap bar to form a smooth seat.

3,697,112
VACUUM PICK UP HEAD
Jay P. Nielson, Bountiful, and G. Allen Allred, Salt Lake City, both of Utah, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed April 15, 1971, Ser. No. 134,208
Int. Cl. B66c 1/02
U.S. Cl. 294—65 18 Claims



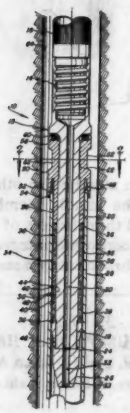
An improved pick-up assembly for use in moving articles includes a pick-up head having an array of suckers for applying suction to articles to be moved. A control apparatus is provided for controlling a flow of fluid through passages extending from a source of low pressure to the suckers so that only the suckers which are adjacent to the surface of an article to be moved are maintained in a fluid communication with the source of low pressure. This control apparatus includes a plurality of solenoid operated valves each of which is associated with one of the passages. An actuator circuit effects initial operation of the solenoids to open the valves for a short period of time. If a sucker applies suction to the surface of an article to be moved during this short period of time, a holding circuit is completed to prevent subsequent closing of the valve associated with the sucker. However, the valves associated with suckers which are ineffective to apply suction to the article to be moved are closed at the end of the short period of time. An indicator circuit is associated with each of the holding circuits to provide an indication of which of the suckers are effective to apply suction to an article to be moved.

3,697,113

DRILL ROD RETRIEVING TOOL

Dieter K. Palauro, Denver, Colo., and James R. Mayer, Dallas, Tex., assignors to Gardner-Denver Company, Quincy, Ill.

Filed March 25, 1971, Ser. No. 127,988
Int. Cl. E21b 31/02
U.S. Cl. 294—86.24 9 Claims



A tool for retrieving tubular drill rods or the like from a drill hole. The tool includes an elongated cylindrical member which is dimensioned to be insertable into the broken or disconnected drill rod to be retrieved. The elongated member includes a frictional coupling made up of a plurality of elastically deformable gripping rings which are retained in sleeved relationship on the elongated member. The retrieving tool also includes a drill rod engaging member having a skirt defining a conical surface which surrounds and wedgingly engages the broken end of the drill rod. The drill rod engaging member is threadedly connected to the elongated cylindrical member. In response to rotation of the retrieving tool the two members move axially with respect to each other to compress the stack of deformable rings into frictional engagement with the broken drill rod whereby the broken drill rod may be retrieved from the drill hole. In an alternate embodiment the elongated cylindrical member is formed in two sections threadedly connected and thereby being axially movable with respect to each other for compressing the deformable gripping rings.

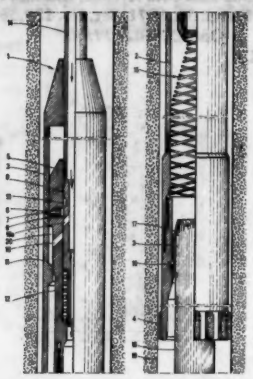
3,697,114

DEVICE FOR GRIPPING ELONGATED MEMBERS

Michel Chatard, Chatou; Pierre Grolet, Montesson, and Remi Reynard, Viroflay, all of France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison (Haute de Seine), France

Filed Dec. 14, 1970, Ser. No. 97,884
Int. Cl. E21b 31/02
U.S. Cl. 294—86.26 11 Claims

Device used for withdrawing from a well a section of drill string wedged therein. The device includes a rod ending with a prolonging member containing a sock-like member adapted to cap said drill string section and to contract under the effect of a longitudinal traction force applied thereto while raising said rod, thereby gripping the drill string section as a result of the friction force generated by said contraction.

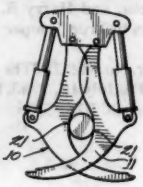


3,697,115

LOG GRAPPLE

Keith E. La Beck, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Jan. 25, 1971, Ser. No. 109,322
Int. Cl. B66c 1/10
U.S. Cl. 294—88 1 Claim



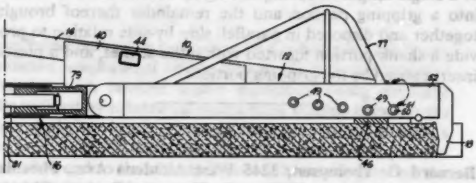
A log grapple of the fixed tong pin type wherein the tongs have a reverse curvature in their confronting surfaces.

3,697,116

LIFTING DEVICE

Ronald Frank Carroll, Hemel Hempstead, England, assignor to National Research Development Corporation, London, England

Filed Nov. 18, 1969, Ser. No. 877,839
Int. Cl. B66c 1/00
U.S. Cl. 294—103 6 Claims



A lifting device includes a lifting toe adapted to engage under an article to be lifted by the device, a top abutment adapted to engage with a top surface of the article, an actuating screw jack adapted to move said lifting toe and said top abutment towards one another and into gripping relationship

with the article, and slotted grid plates presenting a plurality of recessed attachment positions one to which is located substantially over the center of gravity of the article. Where the lifting device is to be used for lifting cast concrete panels, an insert for the lower edge of the panel is used during casting of the panel to provide the panel with a recess adapted to receive said lifting toe.

3,697,117

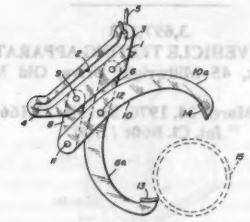
LIFTING TONGS

Clarence E. Larson, Columbus, and Harold G. Schneider, Westerville, both of Ohio, assignors to Martin Marietta Corporation, New York, N.Y.

Filed April 28, 1971, Ser. No. 138,111

Int. Cl. B66c *1/48*

U.S. Cl. 294—106 **25 Claims**



Lifting tongs have curved link members with clamp pads attached to the ends thereof that close upon the object to be lifted, such as a pipe section, when a lifting hook exerts an upward force while positioned in one end portion of a slot in the body portion of the tongs. The clamp pads open to release the object being held upon movement of the lifting hook to the opposite end portion of the slot. Manual fastening of the clamping pads to the object being lifted and manual releasing thereof are avoided, facilitating the convenient transport of the object from one location to another, such as the placement of pipe in a ditch at a construction site. The tongs can be adapted for lifting non-round objects as well as round objects.

3,697,118

AUTOMATIC LIFTING TONGS

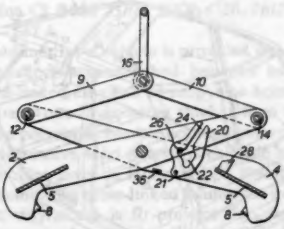
Crichton Lockhart Johnstone, 135 Avon Street, Motherwell, and John Woodhouse Paton, 3 Clark Street, Newmains, both of Scotland

Filed Nov. 30, 1970, Ser. No. 93,698

Claims priority, application Great Britain, Dec. 2, 1969, 58,899/69

Int. Cl. B66c *1/44*

U.S. Cl. 294—110 R **10 Claims**



Lifting tongs have a pair of primary arms forming a pair of jaws for engagement with a workpiece. A latch mechanism interlocks the two arms so that the tongs can be opened and closed automatically by successive movements opening the jaws. Following a first movement opening the jaws, the latch mechanism is engaged to hold the jaws open; the latch mechanism is disengaged by a subsequent movement opening the jaws whereupon it releases the arms to allow the jaws to close. The latch mechanism includes a pivoted latch member mounted on one arm, which latch member is movable between two equilibrium positions to define the engaged and disengaged positions of the latch mechanism.

3,697,119

RAILWAY WHEEL AND AXLE ASSEMBLY

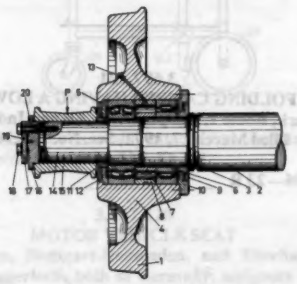
Wilhelmus Lambertus Van Wierst, Santpoort, and Pieter Jozef Marie Paffen, Alkmaar, both of Netherlands, assignors to Koninklijke Nederlandsche Hoogovens En Staalfabrieken N.V., Ijmuiden, Netherlands

Filed Oct. 19, 1970, Ser. No. 82,002

Claims priority, application Netherlands, Oct. 27, 1969, 6916178

Int. Cl. B60b *37/10*; F16b *39/02*; F16c *37/10*

U.S. Cl. 295—36 R **5 Claims**



A flanged wheel and axle assembly of the type having a bearing enclosed against a collar on the axle by a pressure plate system, is provided with two pressure plates, one mounted axially behind the other, the plates being in mutual contact only in a central zone, the plate closest to the wheel resting directly or indirectly against the bearing structure, and the second plate being drawn towards the end of the axle by drawing means extending through the first plate. A sleeve preferably is provided on the axle between the pressure plate system and the bearing structure; the bearing structure preferably comprises spaced cylindrical and adjustable bearing; the drawing means preferably comprises three or more bolts positioned symmetrically about the central zone of contact; and the assembly forms part of a railway car subjected to high loads.

3,697,120

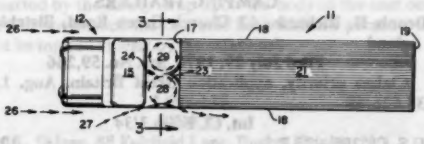
DRAG REDUCER FOR LAND VEHICLES

Walter Selden Saunders, Route #1, P.O. Box 155, Dillwyn, Va.

Filed Nov. 3, 1969, Ser. No. 873,234

Int. Cl. B62d *35/00*

U.S. Cl. 296—1 S **10 Claims**



A drag reducer for a gap in a land vehicle moving through air capable of stabilizing the stagnant air in the gap which tends to rotate and form a horseshoe shaped vortex. The vortex directs the surrounding airstream around the stable vortex and thereby reduces air resistance. The drag reducer is a substantially V-shaped plate having concave sides vertically

mounted midway in the gap existing between a tractor and trailer on the forward panel of the trailer. The plate stabilizes the rotating vortices and, particularly, prevents side winds from forcing the vortices out of the gap, thereby reducing operating costs by eliminating the expensive process of continuously converting high speed air to stagnant air.

The drag reducer can be used on all land vehicles and is readily adaptable for use on railroad box cards, trailers in tandem, single chassis trucks, and vehicles towed by car. The drag reducer can take the form of two plates mounted in parallel on one wall or can be mounted on opposite walls substantially in the same plane. The drag reducer not only reduces operating costs, but also improves the stability of the trailing vehicles and increases car safety.

The drag reducer can also take the form of an opened ended conduit that has one end located at the base of the rotating vortex and the other end either in the slip stream or connected to vacuum apparatus so that stagnant air can be sucked out of the middle of the vortex and thereby stabilize the vortex.

3,697,121

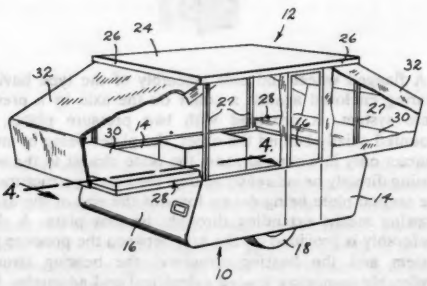
TOWED FOLDING CAMPER HAVING A LOW PROFILE

John R. Park, Route 1, Janiper Drive, Elkhar, Ind.

Filed March 17, 1971, Ser. No. 125,168

Int. Cl. B60p *3/32*

U.S. Cl. 296—23 R **11 Claims**



A camper adapted for towing and having a body and a shiftable top. Sliding platforms are carried by the body and are each shiftable in a generally horizontal plane between a retracted position within the body and an extended position outside the body. The platforms are supported upon vertically shiftable tracks and are urged when in their retracted positions downwardly into the body of the vehicle by the top as it spans and encloses the body.

3,697,122

CAMPING TRAILERS

Dennis H. Richards, 62 Church Green Road, Bletchley, England

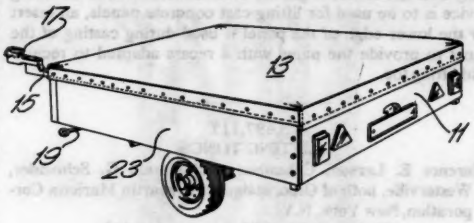
Filed July 29, 1970, Ser. No. 59,266

Claims priority, application Great Britain, Aug. 1, 1969, 38,626/69

Int. Cl. B60p *3/34*

U.S. Cl. 296—23 R **12 Claims**

The invention relates to a trailer for towing behind a vehicle which trailer is designed specifically for camping and is convertible from a compact towing state into a large size unit for supporting a tent and it comprises a main chassis in a longitudinal direction so as to provide a substantially continuous floor surface having an area substantially twice that of the floor area of the trailer in its unextended position. Once the trailer has been moved to its extended position, a frame tent is



erectible around the trailer and is supported on it, together with seat/bunks and a kitchen unit.

3,697,123

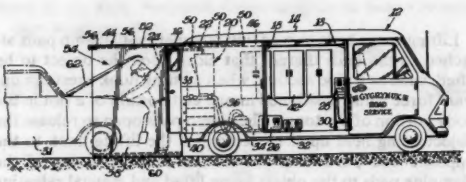
MOBILE VEHICLE TESTING APPARATUS

Walter Gygrynuk, 45 Millwright Drive, Old Mill Manor, Newark, Del.

Filed March 24, 1970, Ser. No. 22,166

Int. Cl. B60r *11/00*

U.S. Cl. 296—24 **13 Claims**



A mobile vehicle testing apparatus includes a van-type vehicle having means in its body for testing the electrical performance of a motor. A power source for these means is also mounted in the body as well as storage facilities for replacement parts. The means are exposed by the opening of a door on the vehicle for ready accessibility with respect to the vehicle being tested.

3,697,124

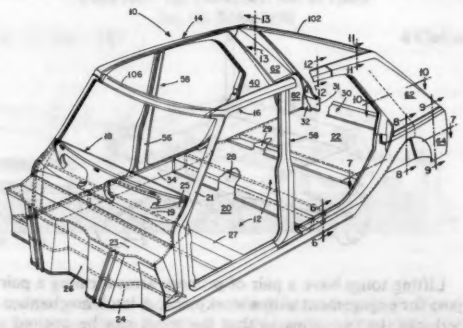
TORSION RESISTANT OPEN END AUTOMOBILE BODY

Henry W. Wessells, c/o The Budd Company 2450 Hunting Park Avenue, Philadelphia, Pa.

Filed Dec. 29, 1970, Ser. No. 102,473

Int. Cl. B62d *25/02*

U.S. Cl. 296—28 R **14 Claims**



A unitized automobile body having a pair of hollow side frames connected to a floor panel and a roof panel. The rear-

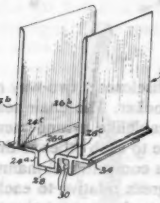
ward extensions of the side frames form hollow D-posts and hollow rear sills in the area over the rear wheel housings. The rear sills are connected by a deep rigid transverse rear panel. The forward extensions of the side frames form hollow A-posts and cowl side panels which are connected to a box-shaped rigid transverse panel formed by the cowl and firewall.

3,697,125

DETACHABLE VEHICLE GLARE SHIELD

John Van Sickle, 1841 Billington Road, East Aurora, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,929
Int. Cl. B60j 3/00
U.S. Cl. 296—97 C 9 Claims



A glare shield for detachable mounting to a vehicle sun visor, vertically disposed, as a downward extension thereof, comprising a body of glare reducing sheet material and a separately constructed clip device having opposing arms for engaging the sun visor, a connecting member between the lower end of each arm, a groove in the lower end of one of said arms extending transversely across its width adapted to receive and hold said body as a downward extension of the sun visor, and a raised portion on the outside surface of either arm for gripping the device, said connecting member and attached arms having a minimal downward extent below the lever edge of the sun visor so as not to create distracting images.

3,697,126

REINFORCED FOAM HEADLINER

James R. Tiffin, Newark, and David C. Trimble, Yorklyn, both of Del., assignors to Haskon, Inc., Wilmington, Del.

Filed Feb. 19, 1971, Ser. No. 117,088
Int. Cl. B62d 25/06; B32b 3/26, 7/02
U.S. Cl. 296—137 A 10 Claims

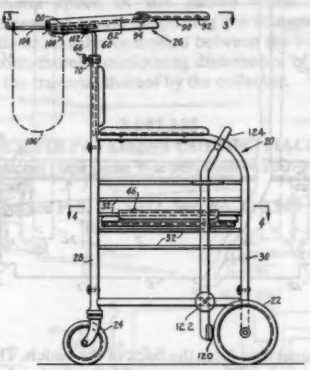
A foam headliner for a vehicle is provided which comprises a wire mesh support sandwiched between two laminated layers of cross-linked ethylene or propylene homopolymer or copolymer foam, one layer being thicker than the other. A composite of a polyvinyl chloride homopolymer or copolymer foam and a decorative solid polyvinyl chloride homopolymer or copolymer film layer is laminated to the thick layer of cross-linked foam. The cross-linked foam is for energy absorption and the vinyl foam is to prevent the vinyl film from developing creases when the headliner is flexed during handling or installation. The wire mesh is for keeping the headliner from sagging between points of support. The wire mesh may be designed to be more flexible about one axis than the one transverse thereto to prevent deforming premolded areas of the headliner when handling or installing the headliner.

3,697,127

PORTABLE SHAMPOO CHAIR

Aura M. Robertson, 1715 Park Avenue, Red Bluff, Calif.

Filed Feb. 23, 1971, Ser. No. 117,911
Int. Cl. A47c 7/02
U.S. Cl. 297—182 3 Claims



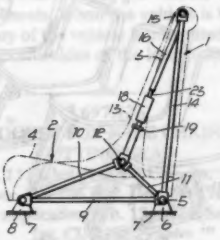
Tray and reservoir removably attached to the headrest of a chair for adjustment relative thereto.

3,697,128

MOTOR VEHICLE SEAT

Werner Strien, Stuttgart-Heumaden, and Eberhard Faust, Stuttgart-Degerloch, both of Germany, assignors to Recaro Aktiengesellschaft, Glarus, Switzerland

Filed Dec. 3, 1969, Ser. No. 881,687
Claims priority, application Germany, Dec. 5, 1968, P 18 12 785.0; Jan. 31, 1969, P 19 04 687.8
Int. Cl. B60r 21/00
U.S. Cl. 297—216 7 Claims



A seat construction for a motor vehicle in which the seat occupant is strapped to the back rest by a safety belt which is secured to the seat rather than to the vehicle body and in which energy-absorbing or dissipating means are provided for consuming a considerable amount of the energy which is produced by the forward propulsion of the seat occupant, for example, in a headon collision, so that the pressure which is then exerted by the safety strap upon the body of the seat occupant will not exceed the bearable limit and this person will thus not be injured at least by the safety belt.

3,697,129

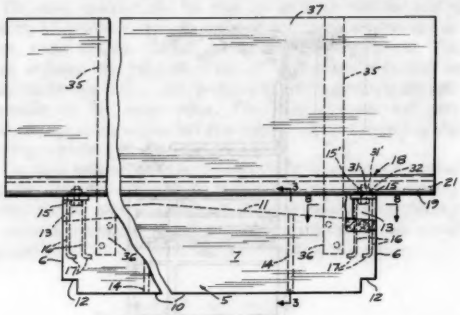
BENCH

Richard L. Sklaar, 88 Fairfield Lane, Roslyn Heights, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,526
Int. Cl. A47c 11/00
U.S. Cl. 297—217 5 Claims

This invention is directed to an outdoor bench having a heavy, not readily displaceable, concrete base with a lateral drainage trough, and extruded hollow seat sections tamper-

proof fastened to the top of the base and fashioned to cooperate with the drainage trough in the base and to maintain such seat sections at ambient temperatures. An advertising display panel may form the back of the bench. The bottom ends of the base are relieved to provide access for the levers of wheeled pry bars to enable the bench to be precisely located without the use of heavy duty construction equipment.

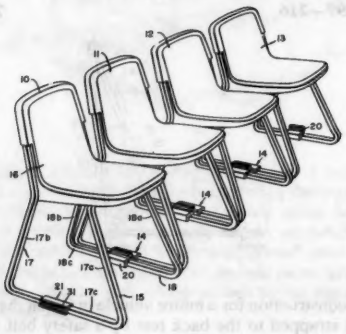


3,697,130

CONNECTOR ASSEMBLY FOR CHAIRS

Chester J. Barecki, Grand Rapids, and Kenneth O. Schneider, East Grand Rapids, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed April 20, 1971, Ser. No. 135,578
Int. Cl. A47c 1/124
U.S. Cl. 297—248 **10 Claims**



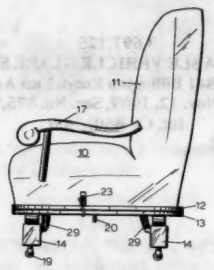
A connector assembly for releasably connecting a pair of adjacent chairs includes a male connector and a female connector, each of the connectors including an elongated generally channel-shaped body adapted to be secured to a tubular supporting base of the chair. The female connector includes an elongated slotted flange which extends laterally outwardly and upwardly from one of the sides of the connector and a second flange which extends laterally outwardly from the bottom of that side. The male connector includes a flange which extends laterally outwardly and upwardly from one side thereof and which can be inserted into the slotted flange of the female connector. The side of the male connector from which the flange extends is shorter than the other side of the connector, and the short side abuts the female connector and is supported by the second flange thereof when the connectors are interlocked.

3,697,131

THERAPEUTIC ROCKER HAVING LATERAL AND LONGITUDINAL ROCKING MOTION

William M. Thompson, 1724 West 11th Street, Erie, Pa.

Filed Jan. 27, 1971, Ser. No. 110,095
Int. Cl. A47c 3/02
U.S. Cl. 297—258 **4 Claims**



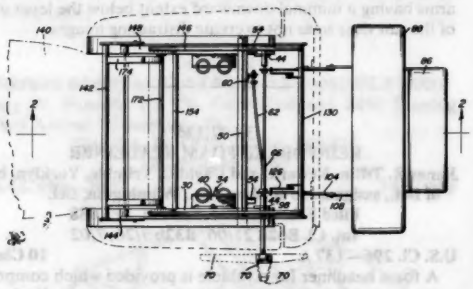
This specification discloses a two-way rocking chair in the form of a platform rocker. The chair seat and backrest are supported on a turntablelike arrangement made up of two disks rotatable relative to each other so that the seat will rock back and forward in a conventional manner or the disks may be rotated ninety degrees relative to each other rotating the seat and backrest ninety degrees relative to the base whereby the rocker will rock from side to side.

3,697,132

MULTIPOSITION LOCK-ROCK ROCKER AND ROCKING TYPE RECLINING CHAIR

Edwin J. Van Surksum, Omaha, Nebr., assignor to Mastercraft Furniture Corporation

Filed April 3, 1970, Ser. No. 25,509
Int. Cl. A47c 3/02
U.S. Cl. 297—269 **8 Claims**

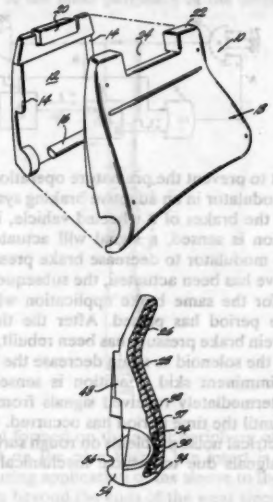


A mechanism incorporated into a platform rocker which enables the rocker to be employed as a conventional platform rocker, as a platform rocker with a multi-position lock, as a reclining chair and as a rocking reclining chair with the lock for the rocking action being manually actuated by lateral movement of a lever-type handle to lock the chair in multiple positions of tilt. The leg rest structure is also manually actuated by the same lever being operable in a fore and aft direction. An arc slide interconnects the chair seat and chair backrest in which the seat is not movable longitudinally and fixed to pivot at the front to retain optimum balance conditions in all positions of the chair structure.

3,697,133
SEAT BACK STRUCTURE

Nicholas Wolofski, Whitmore Lake, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Aug. 6, 1970, Ser. No. 61,704
Int. Cl. B60n 1/06; A47c 3/00, 7/14
U.S. Cl. 297—460 10 Claims

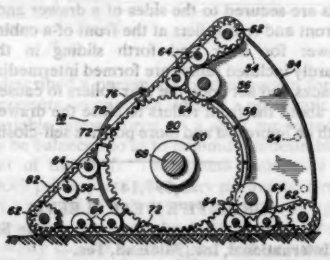


A seat back structure consisting of a supporting frame and a unitary seating back unit mounted on the frame. The seating back unit consists of a molded foam body of seat back shape having a spring assembly embedded therein. The spring assembly includes a plurality of linear springs which yieldably resist seating loads and a border wire on which the linear springs are mounted. Rearwardly extending projections on the foam body engage the frame so as to provide a space into which the linear springs can deflect when subjected to seating loads. The spring assembly is shaped to conform to the seat back shape of the foam body and cooperates with the foam body to provide added stiffness in the lower back area of the seat occupant.

3,697,134
NODULE COLLECTOR

Robert H. Murray, Wescosville, Pa., assignor to Bethlehem Steel Corporation

Filed March 25, 1971, Ser. No. 127,911
Int. Cl. E02f 7/00
U.S. Cl. 299—8 3 Claims



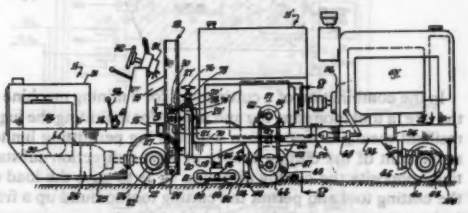
A mechanical nodule collector is lowered to the ocean floor and towed along by a floating towing vessel. The towing means may be either a hoisting rope or a pipe through which collected nodules may be continuously pumped to a floating transport vessel. If the towing means is a pipe, the pipe is connected directly to a buoyant vessel, or pod, which is connected to the floating towing vessel and the floating transport vessel. The collector can be readily raised or lowered by varying the buoyancy.

The collector comprises a framework having a rotating paddle wheel attached thereto which penetrates the ocean bottom and sweeps nodules up a grating where they fall into a basket. The peripheral speed of the paddle wheel equals the peripheral speed of treads supporting the framework so that there is little or no relative motion between the tread and the ocean bottom, thereby minimizing disturbance of the bottom soil during the traversal thereof by the collector.

3,697,135
CONCRETE PAVEMENT CUTTING MACHINE

Cecil W. Hatcher, and Gene Warner, both of P.O. Box 1263, El Monte, Calif.

Filed Feb. 25, 1971, Ser. No. 118,909
Int. Cl. E01c 23/09
U.S. Cl. 299—39 13 Claims

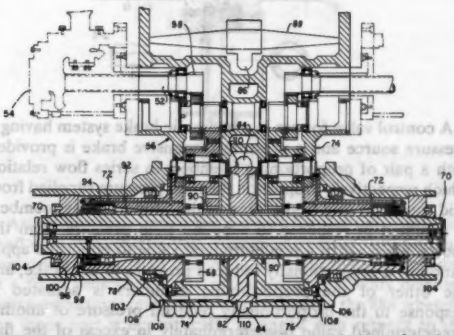


A self-propelled pavement cutting machine comprising a drive truck having a front end having an upright sliding coupling with the rear of a vehicle having an elongated cutter for cutting bumps or grooves, the vehicle having front wheels and rear wheels. When the cutter is active, the vehicle is supported by its two sets of wheels, depth control means being provided for the cutter. The truck has a pump supplying hydraulic fluid to raise and support the rear end of the vehicle with its cutter and rear wheels, the vehicle being supported then by its front wheels. When the vehicle is being pushed by the truck, side sway of the vehicle is prevented as the coupling is arranged on opposite sides of the longitudinal center of the truck and vehicle.

3,697,136
DRIVE SPROCKET FOR WIDE CHAIN OF DRUM CUTTING HEAD

George R. Teeter, 111 Glenview, Oil City, Pa.

Division of Ser. No. 786,650, Dec. 24, 1968, Pat. No. 3,614,162. This application Feb. 17, 1971, Ser. No. 115,965
Int. Cl. E21c 27/24
U.S. Cl. 299—83 9 Claims



A mining machine cutting structure consisting of a single centrally located cutter supporting chain and cutter support-

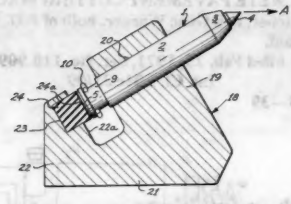
ing rotary elements extending outwardly from the sides of the cutter supporting chain.

3,697,137

RESILIENT MOUNTING FOR CUTTING TOOLS OF MINING MACHINES AND THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Filed Dec. 15, 1969, Ser. No. 885,255
Int. Cl. E21c *25/12, 25/46*
U.S. Cl. 299—86 **24 Claims**



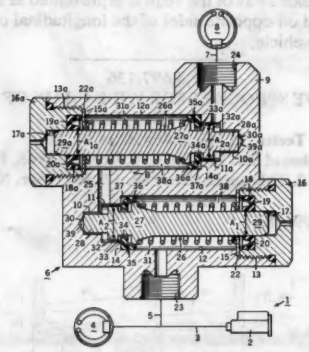
In the combination of a cutting tool for a mining machine or the like, a tool mounting lug and means for mounting the lug, a resilient means in association with the lug permitting limited movement of the cutting tool in at least a direction substantially opposite the cutting direction so as to ease the load on the cutting tool and permit the cutting tool to build up a fracturing pressure against the material being cut.

3,697,138

CONTROL VALVE AND SYSTEM

Paul G. Marting, Ballwin, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed May 8, 1970, Ser. No. 35,823
Int. Cl. B60t *8/26, 11/34*
U.S. Cl. 303—6 C **30 Claims**



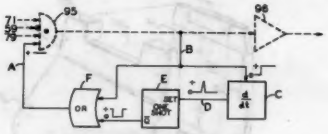
A control valve for use in a hydraulic brake system having a pressure source and a pressure responsive brake is provided with a pair of proportioning members in series flow relation which respectively proportion the fluid pressure supplied from said source to said brake. One of the proportioning members is actuated in response to supplied fluid pressure from the source in excess of a predetermined value to effect the application of a proportionally reduced pressure to the brake, and the other of the proportioning members is actuated in response to the proportionally reduced pressure of another predetermined value predeterminately in excess of the first named predetermined value to further proportionally reduce the pressure applied to said brake.

3,697,139

SKID CONTROL SYSTEM MAXIMUM CYCLIC LIMITER

Delbert R. Elliott, and William T. Lewis, both of South Bend, Ind., assignors to The Bendix Corporation

Filed July 8, 1970, Ser. No. 53,045
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 P **8 Claims**



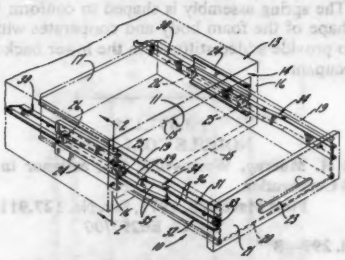
An inhibit to prevent the premature operation of a solenoid valve of a modulator in an adaptive braking system. Upon application of the brakes of a wheeled vehicle, if an imminent skid condition is sensed, a signal will actuate the solenoid valve of the modulator to decrease brake pressure. Once the solenoid valve has been actuated, the subsequent cycle of the modulator for the same brake application will be inhibited until a time period has passed. After the time period has passed wherein brake pressure has been rebuilt, another signal can actuate the solenoid to again decrease the brake pressure if another imminent skid condition is sensed. The inhibit prevents intermediately received signals from actuating the modulator until the time period has occurred. Such an inhibit reduces electrical noise problems on rough surfaces, as well as erroneous signals due to vehicle mechanical and hydraulic resonances.

3,697,140

DRAWER SLIDE ASSEMBLY FOR SELF-CLOSING DRAWER

Richard D. Livingston, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed July 6, 1971, Ser. No. 160,008
Int. Cl. F16c *21/00*
U.S. Cl. 308—3.8 **7 Claims**



Tracks are secured to the sides of a drawer and ride along sets of front and rear rollers at the front of a cabinet to guide the drawer for back and forth sliding in the cabinet. Downwardly inclined ramps are formed intermediate the ends of the tracks and act upon the rear rollers to cause the drawer to pivot about the front rollers to close the drawer automatically with an improved and more positive self-closing action.

3,697,141

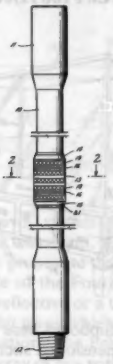
DRILL PIPE WEAR SLEEVE

William R. Garrett, Midland, Tex., assignor to Smith Industries, International, Inc., Midland, Tex.

Filed May 21, 1970, Ser. No. 39,255
Int. Cl. F16c *17/00*
U.S. Cl. 308—4 A **23 Claims**

A metal drill pipe is provided with a metal wear sleeve and an elastomer insert between the wear sleeve and the pipe. The

sleeve is mechanically interlocked to the insert, e.g., by a thread on the inside of the sleeve. The sleeve is made in sections welded together while clamped against the insert with sufficient force to press the thread into the insert. The insert is secured against axial motion on the pipe by cement. There is a mechanical interlock between the insert and the cement, e.g., serrations on the inner periphery of the insert, the cement being applied to the inner periphery of the insert before curing, or a thread formed on the outer periphery of the cement which is cured on the pipe before the insert is compressed thereagainst during application of the sleeve to the insert. The cement extends beyond the ends of the wear sleeve to protect the pipe against corrosion due to well fluid trapped around the pipe adjacent a sleeve end. The sleeve is provided with annular grooves therearound at each end; the grooves increase the flexibility of the sleeve and also serve as wear indicators.

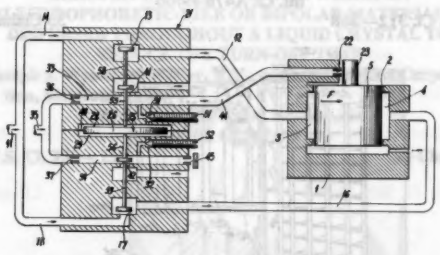


3,697,142

FLUID DEVICES FOR STABILIZING THE POSITION OF A MOVING ELEMENT

Andre Fortier, 22 rue Leon Cambillard, Clamart, France

Filed April 21, 1970, Ser. No. 30,510
Int. Cl. F16c *1/24*
U.S. Cl. 308—5 **4 Claims**



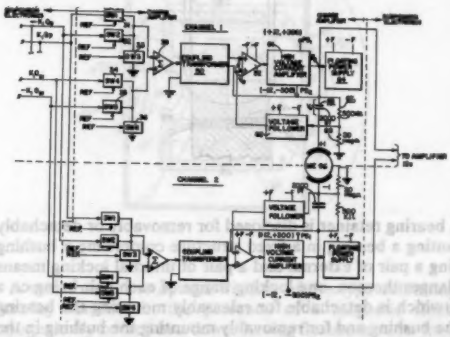
There is described a pneumatic control system for varying pneumatic pressure on opposite sides of a pneumatic bearing so that a variable lateral force on a shaft supported by the bearing may be balanced so as to minimize undesirable lateral displacement of the shaft. The system includes a control device in which primary and secondary pneumatic circuits are separated by a movable diaphragm which moves along so as to vary the pressure on opposite sides of the bearing. The primary and secondary circuits are supplied with pneumatic fluid separately from a pneumatic supply for the bearing. The primary circuit pressure acts on one side of the diaphragm through a first adjustable throttle and responds to pressure variation produced by a sensing jet placed in close proximity to the shaft. The secondary circuit pressure acts on the opposite side of the diaphragm through a second adjustable throttle and contains a reference jet. Both primary and secondary circuits contain variable vents or restrictions to atmosphere which are simultaneously opened or closed depending upon the direction of diaphragm movement. All valve elements are independent members, but move simultaneously with the diaphragm. The system described enables a pneumatically supported shaft to be accurately position-controlled against displacement by lateral variable force.

3,697,143

ELECTROSTATIC GYROSCOPE SUSPENSION SYSTEM

John F. Klinchuch, Orange, Calif., assignor to North American Rockwell Corporation

Filed May 21, 1971, Ser. No. 145,679
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **5 Claims**



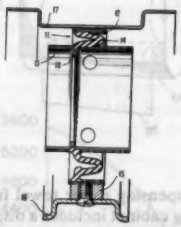
The invention is directed to a suspension system for an electrostatic gyroscope wherein the pulse charges applied to electrode pairs to maintain the gyroscope rotor centered between the electrodes is alternated in polarity so as to minimize the accumulated charge on the rotor.

3,697,144

INTERMEDIATE SUPPORT FOR THE UNIVERSAL JOINT SHAFT OF MOTOR VEHICLES

Bruno Beeskow, Bietigheim, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

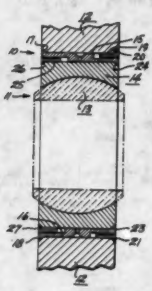
Filed March 16, 1971, Ser. No. 124,845
Claims priority, application Germany, March 20, 1970, P 20 13 305.5
Int. Cl. F16c *35/00*
U.S. Cl. 308—15 **14 Claims**



An intermediate mounting support for the universal joint shaft of motor vehicles that consists of an inner rigid part, accommodating the shaft bearing, of an outer rigid part secured at a fixed vehicle part and of an elastic ring body disposed between the same and consisting of rubber or the like whereby the inner part is eccentrically arranged with respect to the outer part and both the elastic ring body as well as the outer part have an approximately eliptical shape with the major axis thereof extending in the transverse direction; the outer rigid

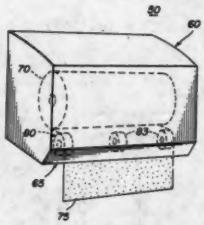
part is secured by means of an elastic spacer at a fixed vehicle part thereby providing an appropriate adjustability by selection of such spacer.

3,697,145
BEARING RETAINER
John W. Day, Jr., Seattle, Wash., assignor to Sealth Aero Marine Company, Seattle, Wash.
Filed Dec. 18, 1970, Ser. No. 99,455
Int. Cl. F96c *23/04*
U.S. Cl. 308—72 7 Claims



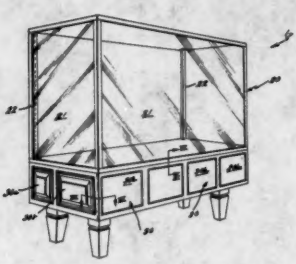
A bearing retainer is disclosed for removably or detachably mounting a bearing in a fixed structure comprising a bushing having a pair of external and a pair of internal locking means or flanges thereon, one locking flange of each pair being on a ring which is detachable for releasably mounting the bearing in the bushing and for removably mounting the bushing in the structure for providing a reliable and economical bearing retainer for easily removing and replacing a bearing without requiring special tools, and yet providing high axial load carrying capabilities for both bearing and bearing retainer regardless of the number of replacements.

3,697,146
PAPER TOWEL DISPENSER
Christian K. F. Bolsen, deceased, late of Vanlose, Denmark (by Karen V. Bolsen, administratrix), assignor to Steiner Company Lausanne S.A., Lausanne, Switzerland
Filed April 23, 1971, Ser. No. 136,714
U.S. Cl. 312—39 19 Claims



A dispenser for dispensing paper towel from a supply roll thereof in a dispensing cabinet includes a dispensing roller and a control shaft concentrically disposed therein for rotation independent thereof, time stop means coupled to the control shaft for halting rotation thereof for a predetermined time interval during each revolution thereof, clutch mechanism releasably coupling the control shaft to the dispensing roller, and adjustable clutch control apparatus for varying the angle through which the dispensing roller rotates before the clutch mechanism is engaged and thereby varying the length of towel web dispensed during each dispensing operation; two embodiments of the invention are disclosed, respectively affording selection among two and three different lengths of towel web to be dispensed.

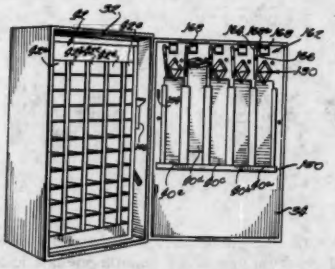
3,697,147
SHOWCASE
Donald W. Schulte, Grand Rapids, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.
Filed Jan. 6, 1971, Ser. No. 104,256
Int. Cl. F16b *12/00*
U.S. Cl. 312—111 22 Claims



The showcase has a chipboard base with a frame mounted thereon. The base is dimensioned such that three of its sides are covered by a combination of panels having modularly interrelated dimensions. All of the panels have a wood grain finish and are painted with a non-intumescent fire retardant paint.

The base is supported by tubular metal posts with a leveler guide threaded into the bottom thereof. A decorative sheath designed to blend with the panels is slidably mounted on the post to cover both the tubular metal post and the threaded post of the leveler glide. The back of the showcase includes a trim strip with a flange projecting beyond the side of the base for overlapping a similar flange of an adjacently positioned showcase. The flange is grooved and can be trimmed off along the groove if the showcase is not placed adjacent another.

3,697,148
VENDING MACHINE
Carl Weber, 1119 Manchester Mall, McHenry, Ill.
Filed Dec. 29, 1969, Ser. No. 888,439
Int. Cl. A47b *49/00*
U.S. Cl. 312—268 33 Claims



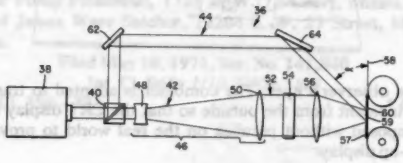
The vending machine includes a plurality of product carriers mounted for free-swinging movement on one or more elongated endless conveyors. Carrier leveling means at the top and bottom of the conveyor loop maintains the carriers in substantially horizontal orientation as they are moved about the ends of the conveyor loop from one vertical run to the other. The contents of the carriers are passed in front of and discharged through an opening in the vending machine cabinet in which one or more transparent windows are mounted for vertical sliding movement. Each window may be urged toward its closed position by means of a spring biased rhombic frame.

3,697,149

FOURIER TRANSFORM HOLOGRAPHIC STORAGE AND RETRIEVAL SYSTEM

Jacob Van Heeckeren, Stanford; David R. Rodal, and Bob V. Markevitch, both of Palo Alto, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Dec. 10, 1969, Ser. No. 883,738
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 16 Claims



A storage and retrieval system wherein information is represented as a Fourier transform, which in turn is recorded on film by a holographic process to thereby preserve the phase as well as the amplitude of the Fourier transform. Coherent light is introduced to a reflective or a transmissive light modulator, which includes a bit array which is selectively energized to represent the information. The Fourier transform is taken of the whole (optical) array of bits with a lens, and is recorded on film as a hologram utilizing both an object and a reference beam obtained from the coherent light source. All bit transforms cover the same area of the hologram since the Fourier transform of each bit covers the exact same area of the recording. A series of holograms may be recorded along a preselected length and width of film in the form of a microfiche or on a continuous tape.

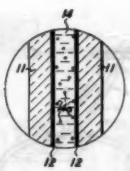
The reproduce portion of the system includes a beam of coherent light which impinges the hologram preferably at an angle equal to the angle with which the reference beam impinged the film during the record process. An image of the modulator array is produced which is visually manipulated, or which may be focused via a lens onto a vidicon picture tube, or other readout device, which provides a continuous electrical signal representative of the light pattern.

3,697,150

ELECTRO-OPTIC SYSTEMS IN WHICH AN ELECTROPHORETIC-LIKE OR DIPOLAR MATERIAL IS DISPERSED THROUGHOUT A LIQUID CRYSTAL TO REDUCE THE TURN-OFF TIME

Joseph J. Wysocki, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,366
Int. Cl. G02f 1/16
U.S. Cl. 350—150 20 Claims



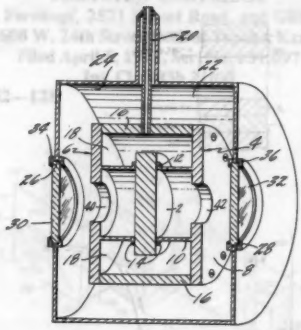
A system for transforming an optically negative liquid crystalline mesophase composition to an optically positive liquid crystalline mesophase composition by an applied electrical field, and imaging compositions which facilitate the relaxation of the transformed optically positive composition into the initial optically negative state. The invention also encompasses imaging systems wherein this electrical field-induced transition images a liquid crystalline imaging composition.

3,697,151

CRYOGENICALLY COOLED FARADAY ROTATOR ELEMENT

Michael L. Skolnick, Monroe, and Carl J. Buczek, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 14, 1970, Ser. No. 63,737
Int. Cl. G02f 1/22
U.S. Cl. 350—151 2 Claims



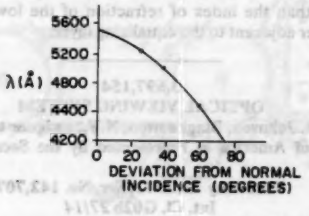
A semiconductive optical window of the type exhibiting a Faraday rotation in the presence of a magnetic field is cryogenically cooled in a dewar having flexure mounts for the element. The flexure mounts comprise metallic supports having a suitable aspect ratio (length to thickness) to guarantee adequate flexure, the supports being bonded to the element. The flexure mounts are disposed on opposite faces of the element and circumscribe a clear optical path through the element near the periphery of the element; this provides a fluid seal between the clear optical path through the element and the extreme periphery of the element, whereby the extreme periphery is immersed in cryogenic fluid. The element is disposed in an evacuated chamber for insulating purposes.

3,697,152

TUNING METHOD FOR PLURAL LAYER LIQUID CRYSTAL FILTERS

James E. Adams, Ontario, and Lewis B. Leder, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,368
Int. Cl. G02f 1/24
U.S. Cl. 350—158 8 Claims



A method for tuning optical devices constructed with one or more liquid crystal films possessing optically negative characteristics which comprises rotating the liquid crystal films with respect to the beam of incident light.

3,697,153
MULTILAYER OPTICAL INTERFERENCE FILTER WITH WIDEBAND SPECTRAL TRANSMISSION REGION AND REDUCED RIPPLE

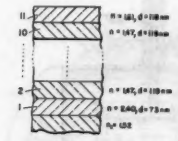
Harald Zycha, Ampfing, Germany, assignor to Balzers Patent- und Beteiligungs-Aktiengesellshaft, Balzers, Furstentum, Liechtenstein

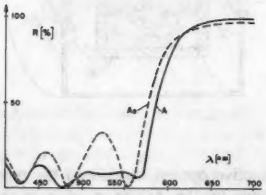
Filed Dec. 16, 1970, Ser. No. 98,786

Claims priority, application Switzerland, Dec. 17, 1969, 18884/69

Int. Cl. G02b *5/28*

U.S. Cl. 350—166 **2 Claims**





A multiple layer optical interference filter having a wideband spectral transmission region with reduced ripple structure is designed to reflect radiation of longer wavelengths. It comprises a carrier having an alternate system of layers of alternately high and low refractivity. Each of the layers are of an optical thickness which satisfies the relation

$$n_i d_i \cos \alpha_i = \lambda 0/4$$

(where n_i denotes the index of refraction of the layer substance, d_i the thickness of the layer, the λ_o the wavelength of the reflection region adjacent the long wave side to the transmission region of interest, and α_i the angle which is formed by the light ray passing through the filter and then normal to the layer plane of the layer in question). The system of layers comprises a light transparent equalizing layer adjacent to the outer one of said low reflectivity layers having a refractive index and having a thickness d such that undesired secondary maxima of reflection are reduced. The thickness of the equalizing layer is equal to $d = 3\lambda/8 \cdot 1/n \cos\alpha$. In this formula, λ denotes the mean wavelength of the transmission region of interest to be smoothed. The letter α represents the angle which the light ray in the equalizing layer forms with the wavelength of the transmission region of interest to be smoothed. The index of refraction of the equalizing layer (n) is larger than the index of refraction of the low refractivity outer layer adjacent to the equalizing layer.

3,697,154
OPTICAL VIEWING SYSTEM

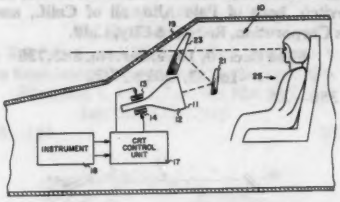
Frithiof V. Johnson, Binghamton, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 12, 1971, Ser. No. 142,707

Int. Cl. G02b *27/14*

U.S. Cl. 350—174 **7 Claims**

Images formed on the screen of a cathode ray tube (CRT) are reflected from a curved mirror having a general aspheric surface of revolution to a partially reflective combiner having two nonparallel hyperboloid surfaces. The combiner is positioned in the normal line of sight of an observer, for instance, in the windshield area of an aircraft cockpit. A collimated CRT image is reflected from the near surface of the combiner



to the observer's eyes. The combiner is adapted to transmit light incident from the outside so that the CRT display is superimposed without parallax on the real world to provide a head-up display.

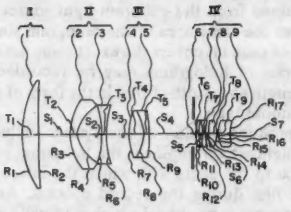
3,697,155
COMPACT ZOOM LENS

Paul L. Ruben, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,307

Int. Cl. G02b *15/16*

U.S. Cl. 350—184 **5 Claims**



Particular lens parameters are provided which give good corrections in a high aperture, wide-angle zoom lens which has a positive power zoom portion and a strong fourth surface. The zoom lens has a minimal number of elements and is compact in both length and diameter.

3,697,156
COSMETIC MIRROR

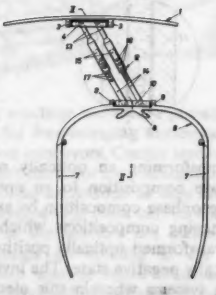
Kauko Juhani Hyvarinen, Joensuu, Finland, assignor to Niplex International Establishment, Vaduz, Liechtenstein

Filed Dec. 28, 1970, Ser. No. 102,002

Claims priority, application Switzerland, Dec. 30, 1969, 19459/69

Int. Cl. G02b *7/18*

U.S. Cl. 350—298 **2 Claims**



A cosmetic mirror comprises a frame worn on the face of a user in a manner similar to a pair of eyeglasses but with only

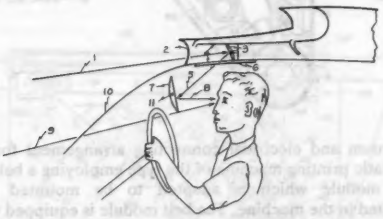
the top rim thereof, the nose support and the arms. A mirror is supported in front of the frame for pivotal movement in horizontal and vertical directions by means of a connecting parallelogram linkage which frictionally holds the mirror in adjusted position so that the user can view his reflection in the mirror.

3,697,157

MOTOR VEHICLE ALL-WEATHER FORWARD VIEW MIRROR

Roger Philip Pizzimenti, 1725 S. W. 72 Court, Miami, Fla., and James Ware Satcher, 12204 S. W. 27 Street, Miami, Fla.

Filed May 10, 1971, Ser. No. 141,840
Int. Cl. B60r *1/10*; G02b *5/08*
U.S. Cl. 350—302 **1 Claim**



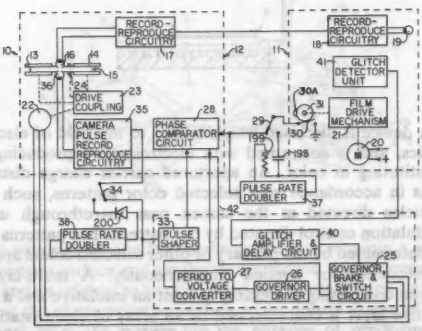
A forward view mirror system which provides a motor vehicle driver with maximum visibility during inclement weather (rain, sleet, snow, etc.). The system includes a first mirror located above the driver's head in a forward view chamber and positioned to reflect an image of the road in front of the vehicle to a second adjustably mounted mirror located directly in front of the driver, a high pressure air chamber including a forwardly directed duct inlet which collects air and precipitation during the forward movement of the vehicle, and a drain duct which evacuates moisture from the high pressure air chamber. The moisture-free air then enters a high velocity air chamber to a duct outlet above the forward view opening and is redirected downwardly to form an air boundary layer which prevents precipitation from reaching the first mirror. Reciprocating wipers remove any moisture which may collect upon the reflecting surface of the first mirror and outer surface of the clear glass panel located above the driver's head.

3,697,158

SOUND-ON-FILM RECORDING SYSTEM

Eugene V. Mateja, Norridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 28, 1970, Ser. No. 76,147
Int. Cl. G03b *31/02*
U.S. Cl. 352—17 **13 Claims**



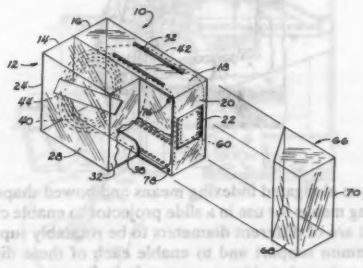
An apparatus for recording on developed motion picture film an audio signal previously recorded on a separate magnetic tape during initial exposure of the film in a camera which also carries a pulsed synchronizing signal. A projector generates a pulsed signal related to the rate of film movement therethrough which is compared with the pulsed synchronization signal upon the magnetic tape. A phase comparator compares the signal from the projector with that played back from the tape and develops a control signal. The control signal is fed to a period to voltage converter which in turn controls the speed of the recorder to maintain synchronization.

3,697,159

FILM STRIP CARTRIDGE

Forrest D. Fernkopf, 2521 Sunset Road, and Gilbert E. Wehmeier, 5608 W. 24th Street, both of Topeka, Kans.

Filed April 5, 1971, Ser. No. 131,097
Int. Cl. G03b *21/00*
U.S. Cl. 352—128 **9 Claims**



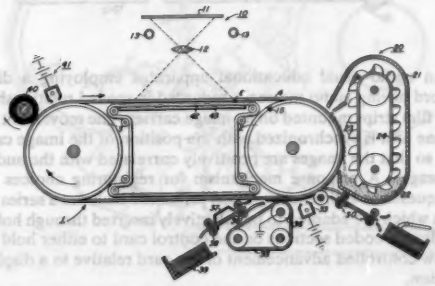
A film cartridge employing an endless, unspooled roll of film having an external loop presenting the active part of the film and feeding from the outside of the roll to the inside thereof. The cartridge has a rectangular case provided with a pair of side-by-side compartments which receive the roll and the loop respectively, the roll being held in an inclined position in which it leans into the adjacent compartment to dispose the outside and inside of the roll therein with the loop. The case has a flat bottom upon which it is self-supporting in an upright position, and a protective sheath fits over the front of the case to provide a self-storing cartridge assembly.

3,697,160

CONTINUOUS IMAGING APPARATUS

Harold E. Clark, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed April 30, 1969, Ser. No. 820,573
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **10 Claims**



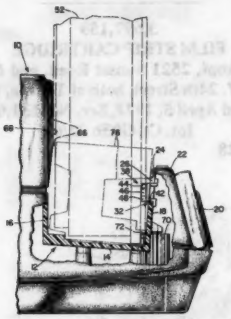
There is disclosed an electrostatic imaging apparatus which incorporates the continuous use of a reusable, flexible imaging member in an imaging system in conjunction with full-frame exposure.

3,697,161

CIRCULAR TRAY SUPPORT AND INDEXING APPARATUS

Stephen Blecher, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed April 1, 1970, Ser. No. 24,582
Int. Cl. G03b 23/06
U.S. Cl. 353—117 7 Claims



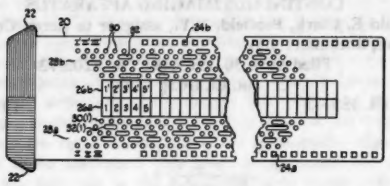
A unique elongated indexing means and bowed shaped tray supporting means for use in a slide projector to enable circular trays that are of different diameters to be rotatably supported on a common support and to enable each of these different size trays to be indexed by a common indexing means.

3,697,162

AUDIO-VISUAL EDUCATIONAL APPARATUS

Alfred E. Geils, Prospect Heights; William J. Raymond, Des Plaines; Richard W. Roberts, Lombard, and Peter K. Shreck, Mount Prospect, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 615,547, March 13, 1967. This application Oct. 8, 1969, Ser. No. 871,154
Int. Cl. G03b 21/00
U.S. Cl. 353—120 1 Claim



An audio-visual educational apparatus employing a disc record having audio messages recorded in spaced relationship and film strips mounted on an image carrier. The movement of a tone arm is synchronized with the position of the image carrier so that the images are positively correlated with the audio messages. A response mechanism for registering choices to the questions and/or instructions presented includes a series of pins which are adapted to be selectively inserted through holes or slots in coded sections on the control card to either hold or allow controlled advancement of the card relative to a display station.

ERRATUM

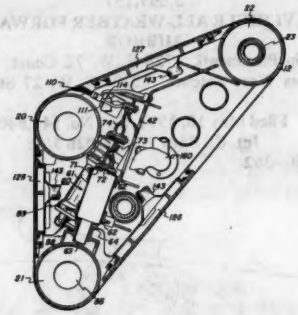
For Class 355—3; see:
Patent No. 3,697,160

3,697,163

PLUG-IN VACUUM AND CIRCUIT SYSTEM FOR ELECTROSTATIC PRINTING MACHINES

William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1970, Ser. No. 102,384
Int. Cl. G03g 15/00
U.S. Cl. 355—3 4 Claims



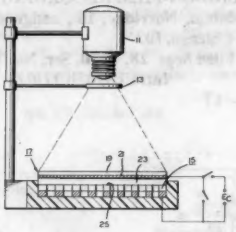
A vacuum and electrical connecting arrangement for an electrostatic printing machine of the type employing a belt assembly module which is adapted to be mounted and dismounted in the machine. The belt module is equipped with a vacuum conduit connection device which can be attached to and detached from a mating device mounted on a fixed frame of the machine. There is also a metallic brush on the frame serving as an electrical connecting device for the conductive belt substrate. Both the vacuum connection and the electrical connection are made automatically when the assembly is inserted into place.

3,697,164

APPARATUS FOR APERTURE CONTROLLED ELECTROSTATIC IMAGE COLOR REPRODUCTION OR CONSTITUTION

Gerald L. Pressman, San Jose, and Thomas D. Kittredge, South San Francisco, both of Calif., assignors to Electroprint, Inc., Palo Alto, Calif.

Filed Feb. 18, 1969, Ser. No. 800,236
Int. Cl. G03g 15/00
U.S. Cl. 355—4 38 Claims



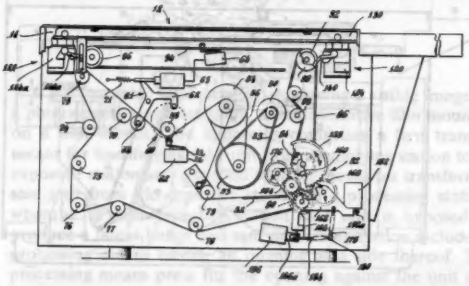
A device is disclosed which relates to the field of electrostatics, and is concerned with electrostatic reproducing or constituting in color. An apertured carries charge distributions in accordance with selected color patterns, such that particles directed at the screen pass therethrough under modulation control dictated by the pattern. The patterns may be determined by the primary or other selected colors applied in sequence, or applied simultaneously. A multi-layered screen comprising preferably at least an insulative and a conductive layer is characterized by an array of electrostatically sensitive apertures. A propulsion field directs charged particles through the screen to a receiving medium, preferably

spaced at a distance from the screen. Charge distribution on the screen controls the flow of particles through the apertures, some of the apertures being in effect blocked, partially blocked, unblocked, and enhanced, depending on the local charge level. This is true for each color or filter employed to produce the patterns of varying tone for sequential use in reconstituting the image in color, with or without contact with the substrate.

3,697,165
RECIPROCATING DOCUMENT CARRIAGE FOR PHOTOCOPIER

Douglas I. Morriston, Norwalk, and Salvatore J. Calvi, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 9, 1970, Ser. No. 96,503
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 **18 Claims**

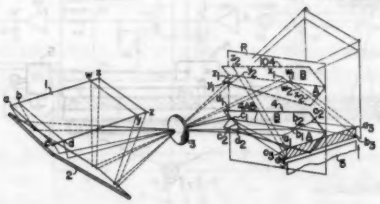


A reciprocating carriage translates an original document sheet through an illuminating station in synchronism with the feeding of copy paper through an imaging station. Sensing switches actuated by the carriage movement control withdrawal of copy paper from a supply roll and severance thereof into sheet length corresponding to the document sheet length. A drive chain loop linked to the carriage is driven via a transmission to translate the carriage through a uniform forward stroke and a slower return, copy stroke. The linkage between the chain loop and carriage includes a lost-motion coupling to accommodate rapid deceleration and acceleration of the carriage as it is transferred from one stroke to the other.

3,697,166
EXPOSING DEVICE FOR COPYING APPARATUS

Shigeru Suzuki, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Aug. 10, 1971, Ser. No. 170,462
Claims priority, application Japan, Aug. 13, 1970, 45/71304
Int. Cl. G03g *15/04*; G03b *27/50*
U.S. Cl. 355—8 **6 Claims**

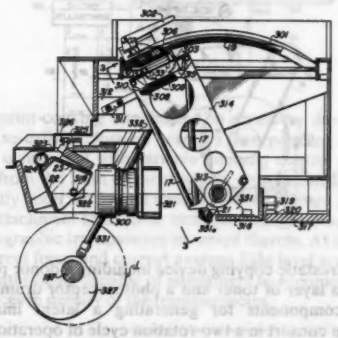


An exposing device for copying apparatus wherein a photoreceptive surface and a reflector are moved, while a copying lens and an original to be duplicated remain stationary, for exposing the photoreceptive surface to an optical image of the original by a slit system for the purpose of producing a duplicate of the original. The reflector comprises two reflecting surfaces meeting at a 90° angle, along a line of juncture lying in a plane oriented at 45° to the optical axis of the lens. It is interposed between the copying lens and photoreceptive surface and moves at a rate which is one-half the rate of movement of the photoreceptive surface in the direction of movement of the photoreceptive surface.

3,697,167
OPTICAL PROJECTION APPARATUS

Ralph A. Hamaker, Penfield, and Edwin Zucker, Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,849
Int. Cl. G03b *27/50, 27/70*
U.S. Cl. 355—8 **8 Claims**

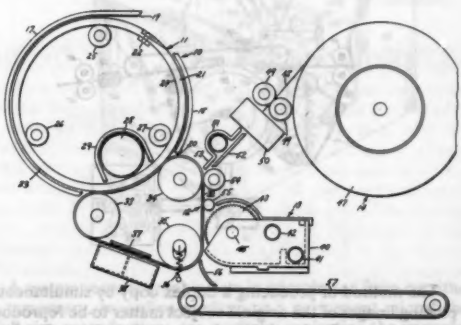


Apparatus for projecting a flowing image of a stationary graphical original onto a moving image plane. The apparatus moves lamps and an optical component from a single cam and a linearly driven cam follower moving synchronously with the moving image plane. Crank arms connect from the cam follower arm to concentric shafts driving the lamps and mirror in synchronous movement with the moving image plane.

3,697,168
ELECTROSTATIC REPRODUCTION DEVICE

Jules Nisenson, New York, N.Y., assignor to Kelvin Research Corp., New York, N.Y.

Continuation of Ser. No. 690,113, Dec. 13, 1967, abandoned.
This application Dec. 29, 1969, Ser. No. 888,167
Int. Cl. G03g *15/00*
U.S. Cl. 355—12 **6 Claims**



An electrostatic reproduction device employing a continuous belt having a charge imparted thereto of a first polarity which is exposed to an image to be reproduced. One surface of a paper web upon which the reproduction will be made is brought in direct contact with the belt after charging and ex-

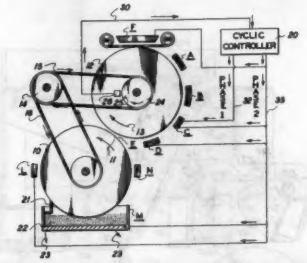
posure. The second oppositely disposed surface of said paper is subjected to the action of a toner which is attracted to the second surface as a result of a charge imparted to the paper by the charged belt.

3,697,169

ELECTROSTATIC RECORDING APPARATUS AND METHOD

John Maksymiak, Penfield; Kenneth M. Beach, Jr., Webster, and James W. Smith, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,339
Int. Cl. G03g *15/22*
U.S. Cl. 355—14 17 Claims



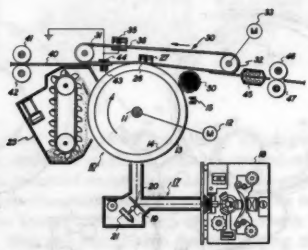
An electrostatic copying device including a donor roller for supplying a layer of toner and a photoreceptor drum and associated components for generating a latent image are operated in consort in a two-rotation cycle of operation under controlled condition. During the first rotation of the cycle of operation the photoreceptor is uniformly charged with a relatively low corona charge and the photoreceptor is used as a biased roller to make uniform the layer of toner placed on the donor roller. During the second rotation of the cycle of operation the latent image is generated and the latent image is developed using the uniformly made toner layer.

3,697,170

AUTOMATIC DUPLEXING APPARATUS

Gopal C. Bhagat, Rochester, and John M. Randall, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1970, Ser. No. 100,884
Int. Cl. G03g *13/00*
U.S. Cl. 355—17 7 Claims



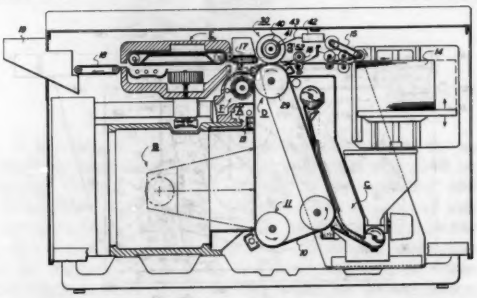
The method of producing a duplex copy by simultaneously placing images of the original subject matter to be reproduced on both sides of a sheet of final support material. A first latent electrostatic image and a second latent electrostatic image containing original input scene information are sequentially formed on a photoconductive plate and developed in the conventional xerographic manner by contacting the charged images with oppositely charged toner particles. The first image is transferred to an image storage member where the polarity of the charged toner particles making up the image is reversed. The first image, carried on the support member, is then brought adjacent to the second image on the photoreceptor surface and a sheet of final support material interposed therebetween. The two oppositely charged images are subjected to an electrostatic force of a polarity and a potential to produce simultaneously a transfer of the images to opposite sides of the final support sheet.

3,697,171

SIMULTANEOUS IMAGE TRANSFER

William A. Sullivan, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1970, Ser. No. 100,970
Int. Cl. G03g *13/00, 15/00*
U.S. Cl. 355—17 4 Claims



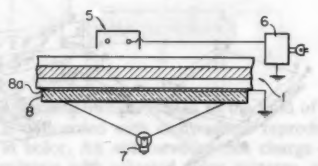
Toner images are sequentially formulated on a photoconductive element. A biased transfer member, adapted to electrically coact with the photoconductor, is brought into operative communication therewith so that a first image is attracted from the photoconductor to the biased member. The image on the member is transported to a region of low voltage contrast and the charge on the image is reversed. A sheet of final support material is brought into contact with a second image on the photoconductor and simultaneously therewith, the first image on the biased member is applied to the opposite side of the sheet whereby the two images are electrostatically transferred to the sheet.

3,697,172

ELECTROSTATIC PHOTOGRAPHY

Wasaburo Ohta, Yokohama-shi, and Setsuo Soga, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed July 24, 1969, Ser. No. 844,536
Claims priority, application Japan, Sept. 9, 1968, 44/64493
Int. Cl. G03g *13/00*
U.S. Cl. 355—17 2 Claims



There is disclosed herein an electrostatic photography method wherein photoconductive sensitive layers are provided on both sides of a support of a photosensitive plate and the reverse side of said plate is illuminated by light either during or before or after corona discharge, to form reproductions on both sides of the photosensitive plate.

3,697,173

ELECTROPHOTOGRAPHIC PROCESSOR CAMERA

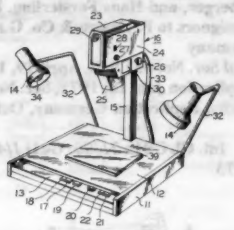
Toshiharu Sasaki; Ryuzo Miyano, and Masaru Onishi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed March 10, 1971, Ser. No. 122,819

Claims priority, application Japan, March 13, 1970, 45/21780

Int. Cl. G03b 27/32

U.S. Cl. 355—27 14 Claims



A photographic apparatus for producing a visible image on a photosensitive unit including a photosensitive film mounted on a film mount. The apparatus comprises a first transfer means for transferring said unit from a supplying station to an exposure station and a second transfer means for transferring said unit from the exposure station to a processing station, whereby at said exposure station said unit is exposed to produce a latent image and said processing station includes a processing means having an opening at a side thereof. The processing means press fits the opening against the unit and forms a processing chamber to receive a processing liquid for producing a visible image on said unit. The apparatus further comprises a removing means for removing said unit from the processing station to a take-out position and driving means for driving said first and second transfer means and said processing means.

3,697,174

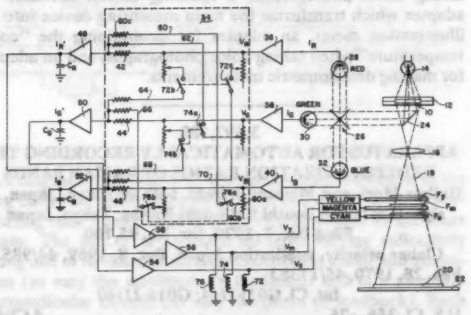
AUTOMATIC COLOR SUBJECT FAILURE CORRECTION WITH ILLUMINANT DISCRIMINATION FOR PHOTOGRAPHIC PRINTERS

Ellsworth J. McCune, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,788

Int. Cl. G03b 27/78

U.S. Cl. 355—38 13 Claims



The color correction level of the printing beam of a color printer is automatically varied from a high color correction level to a low color correction level in proportion to the differences between the detected red, green and blue LATD's of the negative to be printed. A higher degree of color correction is automatically applied to alter the color composition of the printing beam when the negative exhibits an illuminant failure.

3,697,175

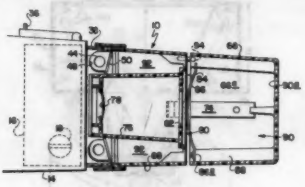
CAMERA ATTACHMENT FOR COPYING PHOTOGRAPHIC TRANSPARENCIES

Robert T. Sullivan, Norwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 18, 1970, Ser. No. 99,395

Int. Cl. G03l 27/32

U.S. Cl. 355—39 26 Claims



A print-copying attachment or accessory device primarily for a so-called "close-up" camera incorporating an electronic flash component with variable intensity control means. Light rays from the flash element which, conventionally, would fall directly upon the frontal surface of a subject are redirected by the attachment so as to be incident upon the rear surface of a photographic transparency mounted therein. At the same time a correct focus and correct average light level are established, the latter being capable of adjustment to accommodate to differences in density of the transparencies.

3,697,176

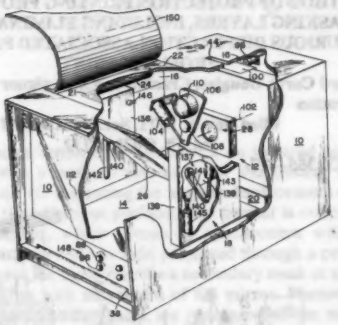
SYSTEM FOR RECORDING DATA ON MICROFICHE AND FOR VIEWING AND MAKING PRINTS OF THE RECORDED DATA

Manfred R. Kuehnle, Lexington, and Dieter Jochimsen, Winchester, both of Mass., assignors to Audac Corporation, Burlington, Mass.

Filed Sept. 16, 1969, Ser. No. 858,375

Int. Cl. G03b 13/28

U.S. Cl. 355—45 11 Claims

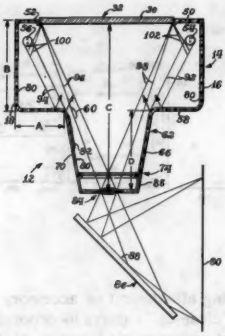


A system records graphic data in microimage form on either a temporary, recording medium or a permanent microfiche. Full-size reproductions are made by projecting the recorded microimages onto a photosensitive medium. The reproductions are made via the temporary storage medium when a quick copy of the original data is desired; they are made from the microfiche when the full-size reproductions are to be retrieved from long-term storage. The system can also display the recorded graphic data.

3,697,177
ILLUMINATING SYSTEM FOR A COPYING MACHINE

Thomas A. Booth, Elgin, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed June 26, 1970, Ser. No. 50,249
Int. Cl. G03b 27/70
U.S. Cl. 355—67 4 Claims

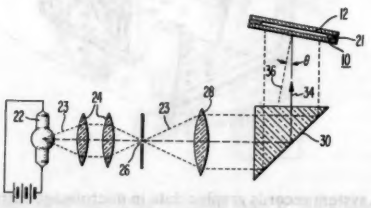


An illuminating system for use in a copying machine to illuminate an original document to be copied and project an image thereof to an exposure plane includes a light chamber having a diffusedly reflective interior surface. The chamber comprises an upper portion having along the upper wall thereof an object window for receiving the original document, and an open ended lower channel portion joined at one end to the lower wall of the upper chamber portion in alignment with an aperture in the latter. A lens is mounted at the free, open end of the lower channel portion, and a pair of lamps are mounted in the upper chamber portion at the sides of the object window outside the field of view of the lens to prevent rays reflected directly from the object window from passing through the lens. The lower wall of the upper chamber reflects rays from the lamps which would otherwise pass through the lens, and is spaced a predetermined distance from the upper wall to fully and uniformly illuminate the original receiving object window with light reflected therefrom.

3,697,178
METHOD OF PROJECTION PRINTING PHOTORESIST MASKING LAYERS, INCLUDING ELIMINATION OF SPURIOUS DIFFRACTION-ASSOCIATED PATTERNS FROM THE PRINT

Edward Curtis Douglas, Cranbury, N.J., assignor to RCA Corporation

Filed Nov. 1, 1971, Ser. No. 194,447
Int. Cl. G03b 27/32
U.S. Cl. 355—77 15 Claims

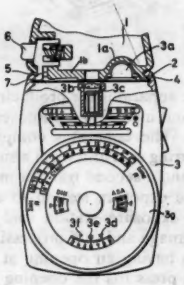


A substrate covered with photoresist is positioned in a parallel, spaced, fixed relationship to a photomask to form a photomask assembly. Then, the photoresist is exposed to a diffraction image of the photomask by projecting collimated light through the photomask. The diffraction image comprises a primary image and a spurious, diffraction-associated secondary image. The light is projected with an oblique orientation to the photomask. The oblique orientation is varied during the exposing to selectively prevent the secondary image from resulting in the uncovering of corresponding areas of the substrate upon development. Then the photoresist is developed to uncover selected areas of the substrate.

3,697,179
LIGHT MEASURING DEVICE

Erwin Pfaffenberger, and Hans Forsterling, both of Erlangen, Germany, assignors to P. Gossen & Co. G.m.b.H., Erlangen, Bavaria, Germany

Continuation of Ser. No. 631,947, April 19, 1967, abandoned. This application Jan. 18, 1971, Ser. No. 107,584
Claims priority, application Germany, Oct. 29, 1966, P 15 47 309.3
Int. Cl. G01n 21/00; G01j 1/42
U.S. Cl. 356—73 3 Claims



The present disclosure relates to a universally applicable light measuring divice, especially photometer, which comprises a main measuring device, e.g., an exposure meter, and a plurality of easily exchangeable auxiliary measuring devices or adapters which, when individually attached to the main measuring device, form therewith new unitary devices, as to outer appearance and function. All adapters have identical bottom portions with two hook-like extensions to be received in corresponding recesses in the main measuring device. One of the extensions is resiliently journalled and may be displaced by a push button for disconnecting the adapter from the main device.

Various new adapters are proposed, as for instance, an adapter for reducing the measuring angle, a dark room adapter, an adapter for determining the exposure time when taking micro-photographs, a focusing screen scanner, an adapter which transforms the main measuring device into an illumination meter, an adapter for determining the "color temperature" when taking color photographs, and an adapter for making densitometric measurements.

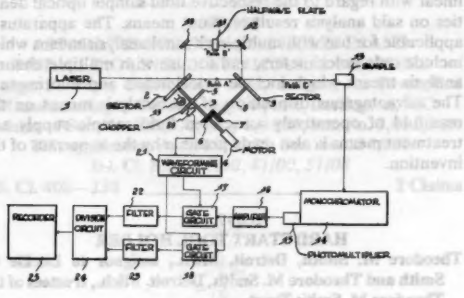
3,697,180
APPARATUS FOR AUTOMATICALLY RECORDING THE HEDEPOLARIZATION RATIOS OF RAMAN BANDS

Hajime Mori, and Mamoru Irizuki, both of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1970, Ser. No. 95,700
Claims priority, application Japan, Dec. 8, 1969, 44/98527; Feb. 28, 1970, 45/17383
Int. Cl. G01j 3/44; G01n 21/40
U.S. Cl. 356—75 4 Claims

Two rays of light polarized parallel and perpendicular with respect to a plane are produced from a single ray of light generated by a laser. By alternately illuminating a sample with the said two rays of light, two Raman scattering light rays having different intensities are produced and in turn applied to a monochromator where they are dispersed according to wave length. After dispersion, the rays are detected by a photomul-

tiplier and the resultant signals applied to a division circuit where the depolarization ratio is automatically calculated.



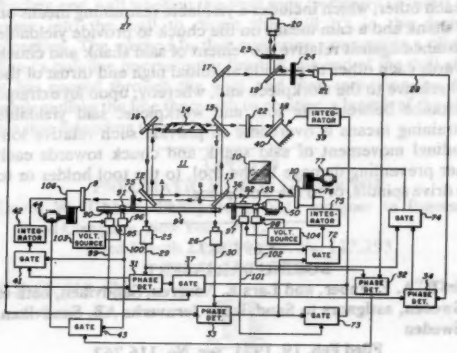
This process is repeated for subsequent sets of signals, thereby effecting a continuous operational sequence.

3,697,181

RING LASER HAVING AMPLITUDE AND PHASE CONTROLLED CROSSED-BEAM ANTI-LOCKING FEEDBACK

Warren M. Macek, Huntington Station, and Chao Chen Wang, Mineola, both of N.Y., assignors to Sperry Rand Corporation

Filed March 14, 1967, Ser. No. 622,983
Int. Cl. G01b 9/02
U.S. Cl. 356—106 LR **6 Claims**



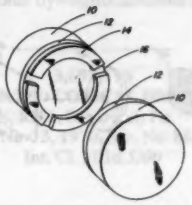
A ring laser provided with at least one mirror external to the ring cavity for reflecting energy from one of the two counter-rotating laser beams back into the ring to couple to the other beam. The mirror is arranged to have varying reflectivity along one of its dimensions and is positioned along said dimension (to vary the amplitude of feedback) and in a direction perpendicular thereto (to vary the phase of feedback). Each of the counterrotating laser beams is extracted from the cavity and the amplitude modulation thereon (due to cross-beam coupling) is detected. If two external mirrors are used, each is positioned to eliminate the amplitude modulation on a respective extracted beam. If only one external mirror is used, it is positioned to make the amplitude modulation on one extracted beam equal in amplitude and opposite in phase to the amplitude modulation on the other extracted beam.

3,697,182

FABRY-PEROT INTERFERENCE MIRROR SEPARATION SYSTEM AND METHOD THEREFOR

Allen M. Erickson, Silver Spring, and Bernard V. Kessler, Greenbelt, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 24, 1970, Ser. No. 58,028
Int. Cl. G01b 9/02
U.S. Cl. 356—112 **2 Claims**



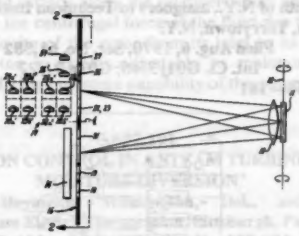
A Fabry-Perot interferometer is provided by vacuum depositing mirrors on two separate quartz supports, vacuum depositing a separator ring of a few wavelengths thickness on one of the mirrors, and then clamping the two mirror sections together, the separator ring thickness providing the separation between the two mirrors.

3,697,183

OPTICAL APPARATUS USING SLITTED MASKS FOR DETECTING ROTARY MOTION OF OBJECT

Sheldon Knight, Mountain View, and Kerwin Peter McCarron, Sunnyvale, both of Calif., assignors to Quantic Industries, Inc., San Carlos, Calif.

Filed June 14, 1968, Ser. No. 737,274
Int. Cl. G01b 11/27, 9/10
U.S. Cl. 356—114 **9 Claims**

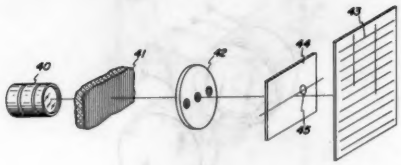


A digital angle readout subsystem for an infrared horizon tracker provides a position reference for the tracker and a readout counter for indicating the angular displacement of the tracker from the reference position. The tracker is coupled to a movable mirror, which moves in synchronism with the tracker. The mirror reflects light projected through a primary mask and causes the light to strike a secondary mask at a location which varies with movement of the mirror. Photodetectors behind the secondary mask are responsive to the moving light patterns to provide electrical signal indications of the reference position and angular displacement of the mirror. The counting portion of the primary mask has evenly spaced slits and bars, the secondary counting mask includes left and right sections for splitting the field of movement of the tracker into two parts. Each section has four individual subsections shifted 90° in phase from an adjacent subsection. Switching between left and right counting sections is provided by switching pulses produced by primary and secondary reference masks. The reference masks have a pattern based on a $v\lambda$ mathematical difference set and provide a reference position signal for the tracker.

3,697,184
APPARATUS FOR EVALUATING THE RECORDING CHARACTERISTICS OF A THERMOPLASTIC PHOTORECEPTOR

Donald R. Lehmbeck, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed April 1, 1971, Ser. No. 130,346
Int. Cl. G01j *3/46*
U.S. Cl. 356—175 **8 Claims**

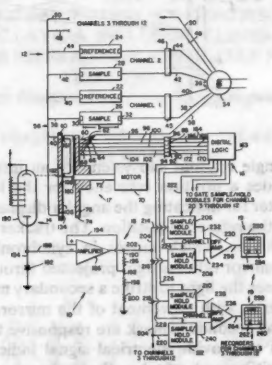


A target for evaluating the characteristics of a thermoplastic photosensitive element is herein disclosed. The target includes a partially transparent or partially absorbing film having at least two fixed narrow bandwidth slits therein and a mask of varying optical density placed on top of or underneath the slit containing film. The target is capable of being positioned in contact with the photosensitive element to reside between the element and a source of exposing radiation. When exposed to a calibrated source of light, an image of known high frequency spatial intensity distribution surrounded by a normal sensitometric exposure results. By observing the effects of this known exposure on a developed thermoplastic photoreceptor characteristics of major concern can be determined.

3,697,185
METHOD AND APPARATUS FOR THE TIME SHARING OF MULTIPLE CHANNEL ANALYSIS MEANS

Aaron Kassel, Tarrytown, and Donald F. Kopelman, New York, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,582
Int. Cl. G01j *3/46*; G01n *21/22*
U.S. Cl. 356—181 **13 Claims**

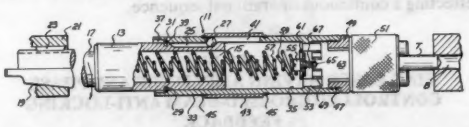


New and improved method and apparatus for the time sharing of multiple channel fluid sample analysis means are provided and comprise operatively associated light source, light sensitive detector means, digital logic means, detector and logic means timing and control means, detector circuit means, multiple channel fluid sample analysis result read-out means and read-out means timing and control means, respectively, said detector means is constituted by a single light-sensitive detector means in the nature of a photo-multiplier tube, and said detector circuit means comprises a single, temperature stabilized log diode and amplifier. An embodiment is disclosed wherein said light source is automatically and precisely tunable light source. In operation, the apparatus is effective to repeatedly scan said multiple channel analysis means and provide simultaneous recordings of the analysis results which are linear with regard to the respective fluid sample optical densities on said analysis result read-out means. The apparatus is applicable for use with multiple channel analysis means which include only colorimeters, and for use with multiple channel analysis means which include colorimeters and fluorimeters. The advantageous disposition of the analysis means on the manifold of operatively associated fluid sample supply and treatment means is also made possible by the apparatus of the invention.

3,697,186
HARD START TOOL HOLDER

Theodore M. Smith, Detroit, Mich., assignor to Lucille G. Smith and Theodore M. Smith, Detroit, Mich., trustees of the Theodore M. Smith Trust

Filed Oct. 12, 1970, Ser. No. 79,818
Int. Cl. B23q *5/22*
U.S. Cl. 408—142 **5 Claims**

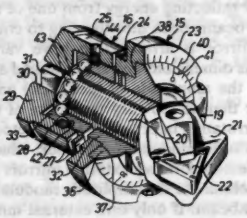


A compensating hard start tool holder for taps, drills, reamers, boring tools, counterbores and milling cutters, having a tool holding chuck and a power rotated longitudinally fed shank, having an operative drive and longitudinally feed relationship between said shank and chuck with springs interposed normally resisting compressive movements of the parts towards each other and normally biasing said parts outwardly of each other, which includes a yieldable restraining means on the shank and a cam means on the chuck to provide yieldable resistance against relative movement of said shank and chuck towards each other to provide an initial high end thrust of the tool relative to the workpiece and, whereby, upon an extreme resistance between the tool and workpiece, said yieldable restraining means is overcome to provide such relative longitudinal movement of said shank and chuck towards each other preventing damage to the tool, to the tool holder or to the drive spindle, or to the workpiece.

3,697,187
BORING BAR INSERT

Kurt H. A. E. Faber, and Lars E. Norgren, Sandviken, both of Sweden, assignors to Sandvikens Jernverks AB, Sandviken, Sweden

Filed Feb. 19, 1971, Ser. No. 116,762
Int. Cl. B23b *29/02*
U.S. Cl. 408—154 **8 Claims**



A boring bar insert for holding a cutting tool in an adjusted position in a boring bar. A non-rotatable threaded shank of

the tool is engaged by an interiorly threaded, rotatable but axially immovable adjustment sleeve so that rotation of the adjustment sleeve causes axial movement of the shank. Resilient means are provided for eliminating axial and radial play between the shank and the adjustment sleeve.

3,697,188

APPARATUS FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS

George F. Pope, Burlington, N.C., assignor to Diversified Manufacturing and Marketing Co., Inc., Burlington, N.C.

Division of Ser. No. 838,270, July 1, 1969, Pat. No. 3,611,549.
This application April 19, 1971, Ser. No. 134,960
Int. Cl. B23b *35/00, 41/00, 51/08*
U.S. Cl. 408—230 **2 Claims**

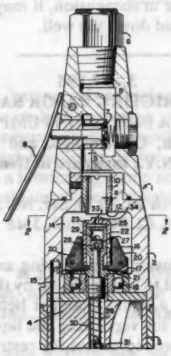
Holes for electrical conductor lines and the like are formed through oftentimes inaccessible wooden obstructions, such as structural frame members of a hollow wall, by utilizing a novel drill having an elongate spring-like shaft with a drill bit on its leading end, and wherein the shaft may be bowed to insert the same into the wall to direct the drill bit in the desired direction. The method further comprises connecting a pliable line (a pull line or conductor line) to one end of the drill after it has passed through the wall, and then removing the drill while pulling the line therewith to position a length of the pliable line extending through the wall.

3,697,189

PNEUMATIC MOTOR GOVERNOR

David W. Tibbott, Phillipsburg, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed March 23, 1971, Ser. No. 127,293
Int. Cl. F01b *25/06*
U.S. Cl. 415—36 **7 Claims**



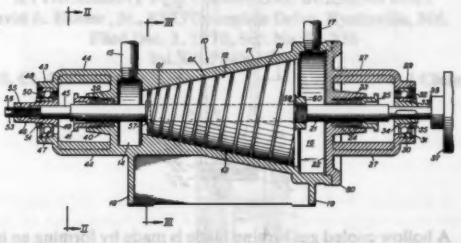
A pneumatic motor governor including a valve port located in the motor supply passage and axially aligned with the motor. The end of the motor carries a spindle and a closed end valve sleeve is slidably mounted on the spindle to reciprocate toward and away from the valve port to throttle air flowing through the port and between the port and the closed end of the valve sleeve. The closed end of the sleeve includes a small hole to allow the air pressure beneath the closed end to balance itself with the pressure on the top or outer face of the closed end, thereby preventing the air pressure in the inlet air from creating forces interfering with the free operation of the valve sleeve. The valve sleeve is moved back and forth by a system of conventional flyweights mounted on the motor spindle.

3,697,190

TRUNCATED CONICAL DRAG PUMP

Walter D. Haentjens, RD 1, Sugarloaf, Pa.

Filed Nov. 3, 1970, Ser. No. 86,429
Int. Cl. F01d *5/00*
U.S. Cl. 415—73 **4 Claims**



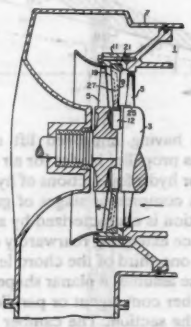
High pressure low volume rate drag pump having a frusto-conical rotor cooperating with a frusto-conical stator wall and having close clearance with the stator wall. The rotor has a helical channel extending therealong, in which the base or root of the channel is formed along a different angle than the cone angle of the rotor. The high pressure is attained by the maximum drag surface along the relatively small passageways together with the centrifugal force of the fluid due to increasing linear velocity of the rotor from its inlet to its discharge end. The rotor is axially adjustable to maintain a close clearance and a high pressure capability of the pump.

3,697,191

EROSION CONTROL IN A STEAM TURBINE BY MOISTURE DIVERSION

Frank J. Heymann, Wilmington, Del., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 23, 1971, Ser. No. 127,234
Int. Cl. F01d *1/00*
U.S. Cl. 415—168 **8 Claims**



An annular array of circumferentially spaced nozzle blades having an airfoil shaped cross section on the low pressure

stages of an axial flow steam turbine wherein the stationary nozzle blades have a first slot adjacent their trailing edge and adjacent a turbine casing, a second slot adjacent the trailing edge and adjacent a rotor and a conduit connecting the slots so that water collected on the stationary nozzle blades is aspirated by the first slot, flows through the conduit, and is ejected from the second slot in atomized form and approaches the rotating blades at a location where the tangential velocity of the rotating blades is substantially lower, thus reducing the erosive effect of the water droplets on the rotating blades of the turbine.

3,697,192

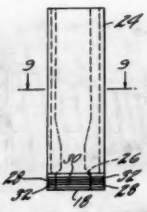
HOLLOW TURBINE BLADE

Charles W. Hayes, East Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 7, 1970, Ser. No. 35,361

Int. Cl. F01d *5/08, 5/18*

U.S. Cl. 416—96 **3 Claims**



A hollow cooled gas turbine blade is made by forming an insert with a hollow airfoil and a hollow root portion and with lateral cooling air passages extending through the wall of the airfoil and positioning the insert in a hollow main blade having an airfoil portion and a notch in the root to receive the root portion of the insert with both root portions having aligned serrations on opposite surfaces for supporting the blade and the insert in a turbine disk.

3,697,193

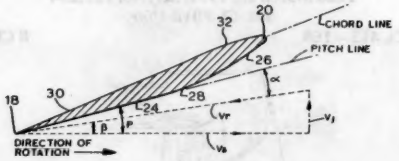
FLUIDFOIL SECTION

Adrian Phillips, 14 Deer Park Cresent, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 11,382, Feb. 16, 1970. This application Dec. 10, 1970, Ser. No. 96,851

Int. Cl. B63h *1/26*

U.S. Cl. 416—223 **13 Claims**



Airfoil sections having improved lift characteristics are described for use as propeller blades for air or marine craft for wings of aircraft for hydrofoil sections of hydrofoil vessels and for rotor blades in compressor stages of gas turbine engines. The improved section is characterized by a planar upper portion and convex face extending rearwardly of the leading edge for approximately one-third of the chord length of the section whereupon the face assumes a planar shape terminating at the trailing edge in either convergent or parallel relation with the upper surface of the section. The camber line of the trailing edge may be deflected in a direction away from the upper surface at an angle to the mean camber line of the section. Such improved airfoils provide lift by generation of a large positive pressure on the face of the section and only a small negative pressure on the upper surface of the section.

3,697,194

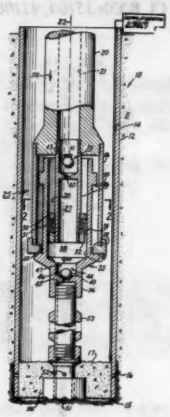
METHOD AND APPARATUS FOR REMOVING SAND FROM WELLS

Fred S. Holmes, P.O. Box 785, Maricopa, Calif.

Filed Sept. 14, 1970, Ser. No. 71,693

Int. Cl. F04b *21/04, 39/10;* **E21b** *27/00*

U.S. Cl. 417—54 **9 Claims**



A method and apparatus for cleaning out wells which have a casing subject to intrusion by sand and other detritus. A tubing, which may be the same tubing used in the routine operation of the well for the removal of liquids such as oil or water, is adapted for reciprocal motion for purposes of this invention, and carries a plunger which telescopically fits into a reference tube which is biased by its own weight or otherwise toward the bottom. A sliding seal fits between the reference tube and plunger to form a variable-volume pumping chamber. A check valve is placed at each end of the pumping chamber, so as to provide for unidirectional movement of sand from the reference tube into the tubing, and up to the surface. The result is the pumping of sand and liquid to the surface. Should there be insufficient liquid in the well to provide velocity sufficient to hold the same in suspension, it may be supplemented by dumping more liquid down the well.

3,697,195

MEANS FOR RESTRICTING VAPOR BACKSTREAMING IN A DIFFUSION PUMP

Frederick R. Johnson, Chittenango, and David R. Palmer, Liverpool, both of N.Y., assignors to General Electric Company

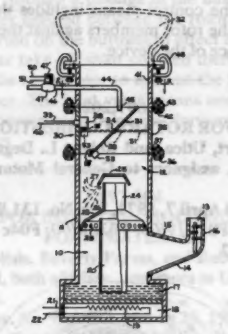
Filed March 26, 1970, Ser. No. 22,896

Int. Cl. F04f *9/08, 5/48*

U.S. Cl. 417—154 **3 Claims**

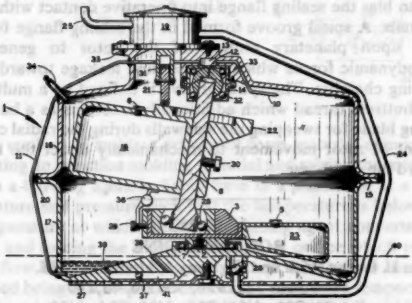
For use with a diffusion pump having an inlet connectable to an enclosure sought to be evacuated by the pump, an outlet, and means including a liquid chamber between the inlet and the outlet and means for vaporizing the liquid, the present invention provides improved means for restricting backstreaming of vapors of the liquid from the chamber and into the enclosure. Basically, the improved means comprises pivotally mounted baffle means positionable between the chamber and

the enclosure and being pivotable between a first position permitting substantially free flow of fluid between the enclosure



and the chamber and a second position substantially restricting flow of fluid between the chamber and the enclosure.

3,697,196
VACUUM PUMPING UNIT
R. Francois Moisdon, 4875 SW 28th Avenue, Fort Lauderdale, Fla.
Filed Sept. 23, 1970, Ser. No. 74,708
Int. Cl. F04b *19/00*
U.S. Cl. 417—211 **8 Claims**

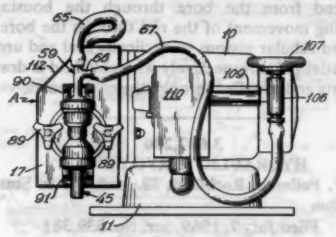


A pumping unit having two swinging unbalanced weights rotating into a vacuum body around a vertical axle. The both unbalanced weights being working together to actuate a pump through a special high frequency device.

Also provided is a lubricating pump actuated by the motion of the axles of the said unbalanced weights.

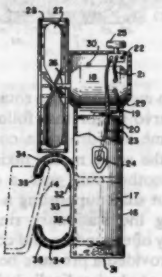
3,697,197
ICE CREAM PUMP
Harold A. Berglund, Afton, and David F. Thomas, West St. Paul, both of Minn., assignors to Waterous Company, St. Paul, Minn.
Filed Aug. 6, 1970, Ser. No. 61,658
Int. Cl. F04b *17/00, 35/00, 35/04*
U.S. Cl. 417—360 **16 Claims**

A double acting pump is provided for pumping air in one cylinder and liquid mix into another. The cylinders and valve housings, together with the inlet and outlet fittings, are readily



separable for cleaning. The entire pump unit may be disassembled for cleaning by the removal of four knobs or nuts.

3,697,198
ATTACHMENT FOR CHARCOAL BURNING UNIT
David A. Holder, Jr., 8303 Donoghue Drive, Hyattsville, Md.
Filed Dec. 1, 1970, Ser. No. 94,236
Int. Cl. F04b *35/04*
U.S. Cl. 417—411 **1 Claim**



An attachment for a charcoal burning structure whereby an induced draft is provided by means of a relatively small portable unit which may readily be secured to the charcoal burning structure when needed and readily released therefrom for storage when not in use.

3,697,199
SLIDE VALVE PUMP
Harry L. Spears, 10919 Sageriver Drive, Houston, Tex.
Filed Aug. 14, 1969, Ser. No. 850,201
Int. Cl. F04b *7/04, 39/10*
U.S. Cl. 417—498 **7 Claims**

A cylindrical piston fixed to the lower end of a cylindrical rod and a second tubular piston slideably carried over the rod.

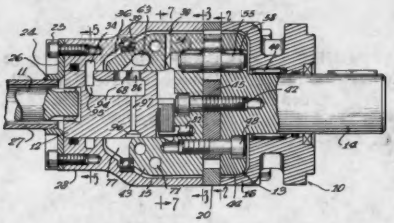
The pistons and a portion of the rod are disposed within the bore of a tubular housing. The housing includes inlet and outlet ports adjacent to its lower and upper ends, respectively, which extend from the bore through the housing wall. Reciprocating movement of the rod through the bore causes the fixed and tubular pistons to cyclically seal and unseal the inlet and outlet ports respectively whereby fluid is drawn into the inlet ports and expelled through the outlet ports.

3,697,200

HYDRAULIC SERVO DEVICE

Frederic W. Pollman, Rockford, Ill., assignor to Sundstrand Corporation

Filed July 7, 1969, Ser. No. 839,381
Int. Cl. F01c *1/08*
U.S. Cl. 418—61 **4 Claims**



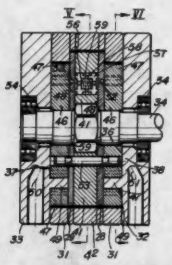
A hydraulic servo motor having a rotary valve for supplying fluid to a rotary servo motor that follows movement of the valve about the same axis driving a concentrically disposed output shaft, with the servo motor taking the form of a stationary internally toothed ring gear, a carrier drivingly connected to the output shaft supporting a plurality of planetary gears interengaging the stationary ring gear and defining therewith a plurality of expanding and contracting fluid chambers, there being provided a pressure balancing recess for the rotary valve member to hydraulically balance the same as well as coplanar ports in the rotary valve member of circular configuration to provide gradual and controlled communication between the main supply and return ports and adjacent ports in the carrier member communicating with the expanding and contracting gear tooth spaces.

3,697,201

MULTIPLE ROTORS AND CONTROL MEANS THERETO IN FLUID HANDLING DEVICES WITH WORKING CHAMBERS OR RADIALLY VARIABLE VOLUME

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed June 4, 1969, Ser. No. 830,246
Int. Cl. F01c *19/08, 11/00*; F03c *3/00*
U.S. Cl. 418—132 **7 Claims**



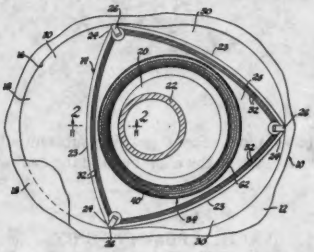
This disclosure is related to improvements in fluid handling devices with working chambers of radially variable volume, such as pumps, motors, transmissions, compressores, engines or combustion engines of the vane type, radial piston type, gear type, trochoid piston type and the like, and the improvement consists in the provision of multiple rotor members and control means thereto. While one of the rotor members is a fluid handling member and another rotor member is a traction member. The rotor members are axially moveable relatively to each other and the control means includes thrust means for thrusting one of the rotor members against the respective stationary control face of the device.

3,697,202

SIDE SEAL FOR ROTARY COMBUSTION ENGINE

Henry F. Reinhart, Utica, and Robert L. Dega, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed April 7, 1971, Ser. No. 131,891
Int. Cl. F01c *19/00*; F03c *3/00*; F04c *27/00*
U.S. Cl. 418—142 **2 Claims**



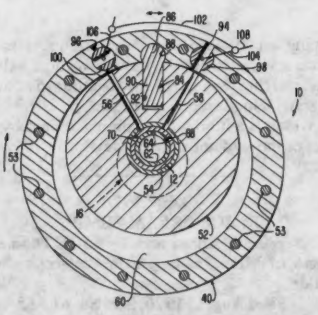
A side seal for a rotary combustion engine includes an elastomeric biasing ring and an L-shaped sealing annulus which has an axial support sleeve loosely retained within a groove formed in the engine rotor and a radial sealing flange engaging the sidewalls of the engine working chamber. The biasing ring is compressively retained within the groove and serves in conjunction with fluid pressure in the engine crankcase to bias the sealing flange into operative contact with the sidewalls. A spiral groove formed in the sealing flange functions upon planetary motion of the rotor to generate hydrodynamic forces which oppose fluid leakage toward the working chamber. The spiral groove is defined by a multiple turn buttress thread which additionally functions as a helical wiping blade for sweeping the sidewalls during the radial component of rotor movement to mechanically direct the fluid toward the crankcase.

3,697,203

ROTARY ENGINE

James L. Butler, 16th and Highway 1, Montara, Calif.

Filed June 22, 1970, Ser. No. 48,220
Int. Cl. F01c *1/00*; F03c *3/00*; F04c *1/00*
U.S. Cl. 418—173 **9 Claims**



A fluid-activated engine having a pair of rotors with one of the rotors being eccentrically mounted within the other rotor

and rotatable about a tubular axle having a fluid inlet port. A buttress interconnects the rotors and is pivotally mounted on the inner periphery of the outer rotor to cause both rotors to rotate in the same plane and direction about their different axes. Inlet valve means in said axle controls the flow of a fluid under pressure through a passage in the inner rotor to an expansion chamber defined between the rotors to cause a fluid force to be exerted on the buttress to effect rotation of the rotors and a power take-off shaft coupled thereto. Valve means is provided in the outer rotor to exhaust the fluid from the expansion chamber. The inlet valve means and the outlet valve means can be constructed to permit forward or reverse rotation of the rotors.

3,697,204

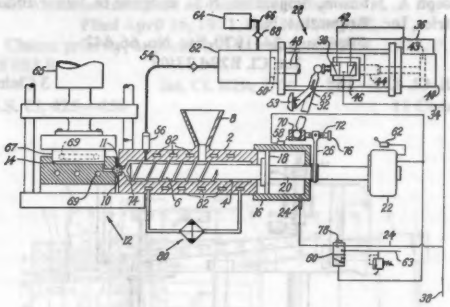
APPARATUS FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL

William T. Kyritsis, Beverly Farms, and Robert C. Simmonds, Jr., Topsfield, both of Mass., assignors to USM Corporation, Boston, Mass.

Division of Ser. No. 714,612, March 20, 1968, abandoned. This application May 7, 1970, Ser. No. 47,921

Int. Cl. B29f *1/04*

U.S. Cl. 18—30 CV **2 Claims**



A method of molding articles of foam material comprising melting an injection molding material and mixing the material with a blowing agent in liquid form in a plasticator at a temperature and pressure such that the temperature is below the temperature at which the liquid foaming agent converts to a gas, and forcing the mixture through an orifice which resists the flow of the material to impart heat thereto, the heat imparted being of a magnitude sufficient to raise the temperature of the mixture to at least equal that at which the liquid foaming agent converts to a gas, and delivering the mixture, containing the gas, to a mold cavity.

An apparatus for molding articles of foam materials in accordance with the above method.

3,697,205

MOLD SYSTEM AND APPARATUS FOR PRODUCING A COMPOSITE PANEL

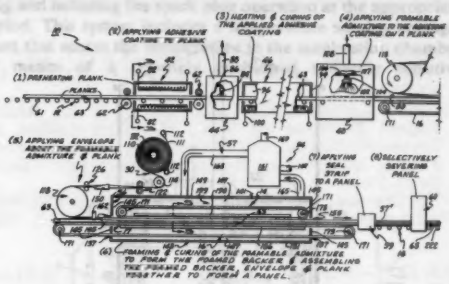
Richard J. Ross, Moraga, and Harry X. Tjon, Fremont, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 2, 1969, Ser. No. 838,431

Int. Cl. B29d *27/00*

U.S. Cl. 425—4 **20 Claims**

An improved mold system and apparatus for producing a composite building panel comprised primarily of a foam backed plank, wherein during manufacture of the panel means are provided for selectively applying and holding a moisture impervious envelope about a foamable backer material in such a fashion that the envelope can assist in molding the foamable material into the desired shape during the foaming



and curing thereof and thereafter serve as a moisture impermeable membrane in the finished product.

3,697,206

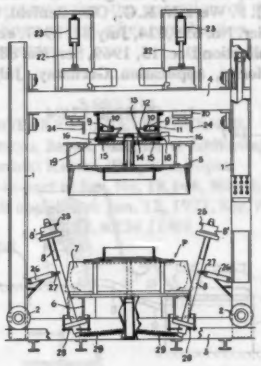
PRESS FOR REBUILDING OF TIRES

Pericle Bonazzi, via 4 Nov., Boretto, Italy

Filed March 10, 1971, Ser. No. 122,794

Int. Cl. B29h *5/02*

U.S. Cl. 425—20 **4 Claims**



The retreading of automotive tires may be effected by means of a movable frame, guided on rails, supporting the upper half of a tire mold and a single set of controlling means for a plurality of press molds.

3,697,207

APPARATUS FOR PRODUCTION OF CASTING MOULDS

Olof Albert Ordqvst, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Feb. 18, 1971, Ser. No. 116,559

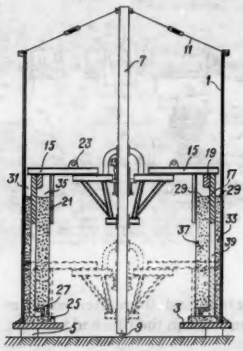
Claims priority, application Sweden, March 31, 1970, 4420/70

Int. Cl. B28b *1/14*

U.S. Cl. 425—63 **5 Claims**

Apparatus for making inner and outer casting mould parts of settable mould material and shaped for forming elongated castings having substantially congruent transverse cross-sections along their lengths comprises a stationary outer shell that serves as a form for the outer wall of the outer mould part and has a length exceeding the length of the casting. An annular pattern shaped in cross-section to conform to the cross-sectional shape of the casting and an inner shell that serves as a form for the inner wall of the inner mould part, both of which are of a length substantially less than the length of the casting, are mounted for movement axially of the outer shell such that

the pattern and inner shell can be positioned successively at different positions along the length of the outer shell to enable the mould parts to be made in a series of sequential stages section by section.



3,697,208
APPARATUS FOR FILLING MOLDS

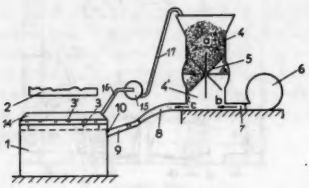
Edmund Munk; Herbert Haas, and Gerd Weinberg, all of Oberstenfeld, Germany, assignors to Furnier-Und Sperrholzwerk, J. F. Werz Jr. K.G., Oberstenfeld, Germany

Division of Ser. No. 655,024, July 21, 1967, abandoned. This application Dec. 15, 1969, Ser. No. 889,781

Claims priority, application Germany, July 29, 1966, F 49820

Int. Cl. B28b *13/04*

U.S. Cl. 425—147 **9 Claims**



The nonflowing molding materials are blown into the mold cavity which has a screen defining one surface of the article to be molded. The materials first fill up the remote areas of the cavity as the carrying air vents through the screen. As the cavity fills up to the feeding nozzle, a vent flap in the nozzle body opens up, allowing the carrying air to vent through the screened opening exposed by the flap until the mold is completely filled and the air is cut off.

3,697,209
APPARATUS FOR MANUFACTURING REINFORCED TUBINGS FROM PLASTIC MATERIALS

Walter Hugo Schiesser, Zurich, Switzerland, assignor to Schiesser AG, Zurich, Switzerland

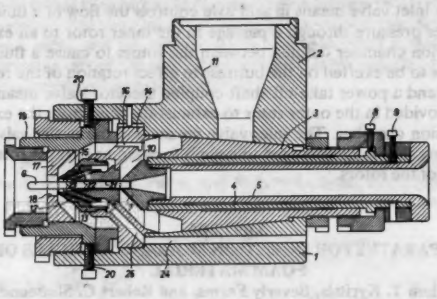
Filed Sept. 16, 1969, Ser. No. 858,368

Claims priority, application Austria, Sept. 20, 1968, 9172/68

Int. Cl. B29f *3/04, 3/10*

U.S. Cl. 425—109 **5 Claims**

In the manufacturing of tubings from rubber or other plastic materials the steps of continuously extruding a first inner layer of the tubing wall in an extruder head over a guide serving to form the cavity of the tubing, continuously applying strand-like reinforcing material through feed passages onto the outer surface of the wall part forming in such way and still in plastic state and then coating this reinforced inner wall part by at least one further layer of a plastic substance, to thereby provide tubings containing a reinforcing lining in the wall material to give reinforcement against internal pressures.



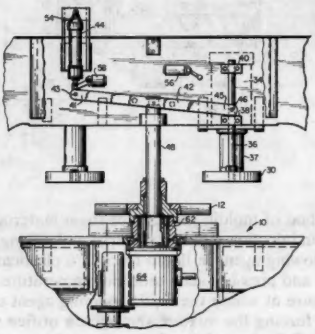
3,697,210
CLOSURE DEVICE FOR MULTIPLE INJECTION BLOW MOLDING MACHINE

Joseph A. Johnson, Brigantine, N.J., assignor to Jomar Industries, Inc., Brigantine, N.J.

Filed Aug. 24, 1970, Ser. No. 66,442

Int. Cl. B29d *23/03*

U.S. Cl. 425—168 **3 Claims**



A closure device for blow molding apparatus having a rotatable turret with parison pins projecting from the face thereof and separable mold halves encompassing the pins to define mold cavities thereabout. A lever interconnects the movable segment of the mold half and a relatively fixed pivot point. The turret is connected to the lever intermediate the pivot point and the mold half to move a fraction of the distance of the mold half such that the pins and molded objects thereon clear the mold halves upon opening thereof for rotation of the turret.

3,697,211
EXTRUSION DIE

Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

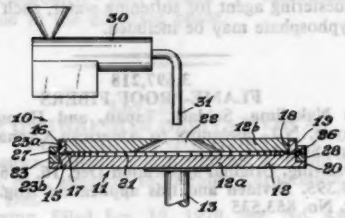
Filed Aug. 13, 1970, Ser. No. 63,546

Int. Cl. B29f *3/04*

U.S. Cl. 425—191 **3 Claims**

Extrusion dies are prepared from diverse materials having

diverse thermal coefficients of expansion in such a manner that the die plate is held to the die body by the differential thermal expansion or contraction of the die as it attains operating temperature.



3,697,212

MOLDING PRESS

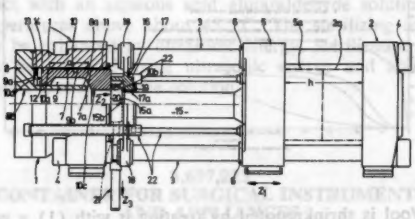
Richard Herbst, Munich, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed April 16, 1971, Ser. No. 134,680

Claims priority, application Germany, April 24, 1970, P 20 19 883.8

Int. Cl. B29c *3/00*

U.S. Cl. 425—450 **11 Claims**



A molding press has hydraulic transporting means for rapidly moving a mold-supporting movable platen toward and away from a fixed mold-supporting platen. A hollow main piston is connected by coupling means with a connecting beam projecting from the movable platen to open and close the mold with great force. Before the transporting means retract the movable platen, the coupling means is withdrawn from the path of the beam so that the beam can enter the hollow piston whereby the length of the machine is reduced.

3,697,213

COMBUSTION SYSTEM FOR A HEATER OR THE LIKE

Hans Joachim Ehrenberg, Wolfsburg, Germany, assignor to Volkswagenwerk AG, Wolsburg, Germany

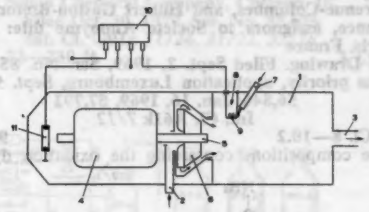
Filed May 3, 1971, Ser. No. 139,374

Claims priority, application Germany, May 5, 1970, P 20 21 893.3

Int. Cl. F23h *5/08*

U.S. Cl. 431—79 **5 Claims**

A combustion system, particularly for a fuel burning heater that incorporates a glow plug for initiating combustion and a spark plug for maintaining the combustion. An improved switching arrangement is employed for shutting off the glow plug and initiating the spark plug operation at the appropriate period. This system includes a temperature sensing arrangement that senses the temperature in the combustion chamber by means of a remotely positioned radiantly sensitive switching element. This switching element in effect views the temperature in the combustion chamber through a hollow shaft that drives a fan, which fan circulates the combustion products through the chamber. The sensing element may also be employed for continuing the operation of the fan for a predetermined time period after combustion in the combustion chamber ceases.



3,697,214

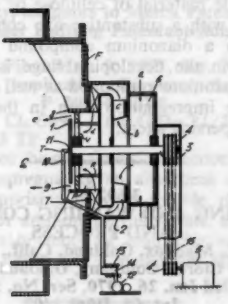
ROTARY PLATE OIL BURNER

Shoichi Tsuji, Tokyo, Japan, assignor to Ishikawajima Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of Ser. No. 18,146, March 10, 1970, abandoned. This application Jan. 12, 1971, Ser. No. 105,934

Int. Cl. F23d *11/04*

U.S. Cl. 431—168 **1 Claim**



An oil burner wherein a rotary blower system supplies air to a stationary fuel supply pipe. The pipe has no internal horizontal part except for a short tip of its nozzle. This arrangement counteracts solidification of oil in the supply pipe. Said tip is positioned in such manner that liquid fuel is discharged therefrom centrally of, and in the direction toward, a rotary plate. A blower supplies compressed air to the interstice between housing and plate. From there, a mixture of oil and air then enters a burner ring or the like.

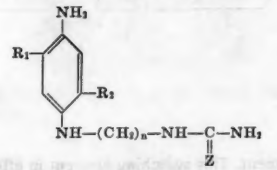
3,697,215

DYEING HAIR WITH N-(UREIDOALKYL)- AND N-(THIOUREIDOALKYL) - PARA - PHENYLENE DIAMINES

Gregoire Kalopissis and Jean Gascon, Paris, Andree Bugaut, Boulogne sur Seine, Jacqueline Gallien, La Garenne-Colombes, and Hubert Gaston-Breton, Paris, France, assignors to Societe Anonyme dite: l'Oreal, Paris, France

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,784
Claims priority, application Luxembourg, Sept. 9, 1968, 56,846; Jan. 16, 1969, 57,792
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.2 9 Claims

Dye compositions containing the oxidation dye:



and the method of using it to dye live human hair.

3,697,216

PROCESS FOR THE PRODUCTION OF WATER-INSOLUBLE AZO DYESTUFFS ON TEXTILE MATERIAL OF CELLULOSE OR PROTEIN FIBERS

Hasso Hertel and Kurt Gehre, Offenbach (Main); Rudolf Lowenfeld, Buchschlag; and Uwe Kosubek, Offenbach (Main), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfort am Main, Germany

No Drawing. Continuation of abandoned application Ser. No. 728,899, May 14, 1968. This application Feb. 10, 1971, Ser. No. 114,387
Claims priority, application Germany, May 18, 1967, F 52,448
Int. Cl. D06p *3/68*
U.S. Cl. 8—46 5 Claims

Process for the production of water-insoluble azo dyestuffs on textile material of cellulose or protein fibers by impregnation with a substantive azo component and developing with a diazonium compound of an aromatic amine, wherein the developing stage is carried out by adding the diazonium compound as well as alkali binding agents to the impregnation bath in the presence of a wetting or dispersing agent.

3,697,217

BLEACHING AND WASHING COMPOSITION AND PROCESS

Lodric L. Maddox, Oakland, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Jan. 26, 1970, Ser. No. 5,600
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 2 Claims

A solid bleaching mixture of a peroxygen compound such as sodium perborate tetrahydrate, sodium perborate monohydrate, or sodium monopersulfate, and an alkalinity booster such as sodium carbonate, sodium silicate or trisodium phosphate, effectively removes stains from household laundry when the mixture is added to the wash water in an amount which provides between about 50 and 150 parts per million available oxygen and a pH between about 10 and 12. When between about 50 and 500 parts per million of a surfactant, and between about 5 and 25 parts per million of an anti-deposition agent such as carboxymethyl cellulose or polyvinyl pyrrolidone are added to the wash water either together with the bleaching mixture or separately, the laundering is particularly effective. A sequestering agent for softening water, such as sodium tripolyphosphate may be included.

3,697,218

FLAME-PROOF FIBERS

Akira Nakajima, Saidaiji, Japan, and Hiroshi Suzuki, Wayne, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Dec. 16, 1965, Ser. No. 514,395. Divided and this application Aug. 27, 1969, Ser. No. 853,535
Int. Cl. D06
U.S. Cl. 8—115.5 4 Claims

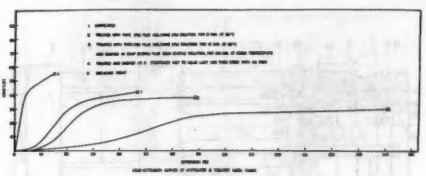
A process for preparing flame-proof polymers, particularly in fiber form, comprising reacting a polymeric material containing, as one constituent thereof, a polymerized ethylenically unsaturated glycidyl compound with a bromine, chlorine, and/or phosphorus compound capable of reacting with epoxy groups. Preferably such reaction is conducted after said polymer is spun into fiber form.

3,697,219

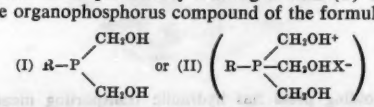
SHRINKPROOFING AND IMPROVEMENT IN STRETCH CHARACTERISTICS OF WOOL

Harold R. Richards, Guelph, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed July 8, 1969, Ser. No. 839,840
Int. Cl. D06m *3/04, 3/10*
U.S. Cl. 8—127.6 14 Claims



Wool is shrinkproofed by treating it with (1) a water soluble organophosphorus compound of the formula



where R is hydrogen, alkyl or alkenyl and X is an anion in Formula II or the wool is treated with the phosphorous oxide of a compound of Formula I and (2) melamine; a water soluble alkyl ether of methylol melamine or methylolmelamine. Then the wool is washed with an alkaline solution to impart stretch characteristics.

3,697,220

BACTERIA GROWTH INHIBITING TEXTILES AND DRY CLEANING AND DISINFECTING COMPOSITIONS AND PROCESSES

George C. Schwartz, Sanford, Fla., assignor to Schwartz Chemical Company, Incorporated, Casselberry, Fla.

No Drawing. Continuation-in-part of application Ser. No. 852,491, Aug. 22, 1969. This application July 6, 1970, Ser. No. 52,764
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 11 Claims

Disinfection of, and production of bacteria growth inhibiting fabrics or textiles is accomplished by simul-

taneous dry cleaning and disinfection procedures involving contact of the textile with an antimicrobial agent containing drycleaning solution in the form of an emulsion of the "water-in-oil" type and which contains a fat solvent in the continuous phase and an aqueous solution of 1 - (3 - chloroallyl - 3,5,7 - triaza - 1 - azoniaadamantane chloride in the dispersed phase.

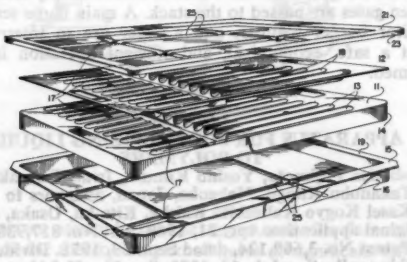
3,697,221
USE OF THIONIUM DERIVATIVES AS CORROSION INHIBITORS
Derek Redmore, Ballwin, and Bernardus A. Oude Alink, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,046
Int. Cl. C23f *11/04, 11/16*
U.S. Cl. 21—2.5 6 Claims

1,2-dithiole - 3 - thiones, particularly the quaternaries thereof (i.e., thionium derivatives), are particularly useful as corrosion inhibitors in aqueous and/or aerated and/or highly acidic systems. The yields of thionium derivatives are increased by reacting 1,2-dithiole-3-thiones with quaternizing agents by reducing the amounts of, and preferably in the substantial absence of, solvents.

3,697,222
STERILIZATION WITH GLUTARALDEHYDE
Gonzalo Sierra, Mississauga, Ontario, Canada, assignor to Ontario Research Foundation, Toronto, Ontario, Canada
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,623
Int. Cl. A61l *13/00*
U.S. Cl. 21—54 A 16 Claims

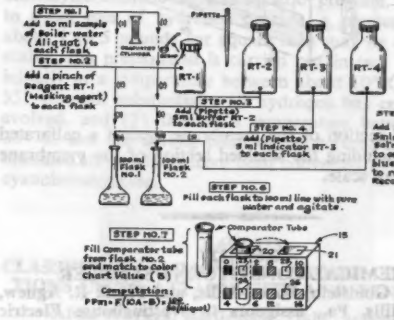
Sterilization is achieved by contacting a contaminated object with an aqueous acid glutaraldehyde solution at temperatures above about 45° C. The sterilizing action may be enhanced by ultrasonic energy. Sterilization also may be achieved using ultrasonic energy and aqueous alkaline glutaraldehyde solution.

3,697,223
CONTAINER FOR SURGICAL INSTRUMENTS AND APPLIANCES
John N. Kovalcik and Donald B. Hovis, Port Credit, Ontario, Canada, assignors to Medipak Corporation Limited, Toronto, Ontario, Canada
Filed July 14, 1970, Ser. No. 54,792
Int. Cl. A61l *3/00*
U.S. Cl. 21—83 11 Claims



An autoclavable tray for surgical implements having a transparent lid and liner of a plastic material, having a non-sticky non-scratching surface, dimensionally stable at autoclave temperatures, and tending not to provoke an immune reaction when introduced into the human body.

3,697,224
TITRATION OF EXCESS CHELATING AGENT
Jay C. Means, River Forest, Ill., assignor to Nalco Chemical Company, Chicago, Ill.
Filed Oct. 30, 1970, Ser. No. 85,676
Int. Cl. G01n *21/24, 31/22, 33/18*
U.S. Cl. 23—230 R 3 Claims


STEP NO.1
Add 50 ml sample of Boiler water (Aliquot) to each flask
STEP NO.2
Add a pinch of Reagent RT-1 (Masking agent) to each flask
STEP NO.3
Add (Pipette) 5 ml Buffer RT-2 to each flask
STEP NO.4
Add (Pipette) 5 ml Indicator RT-3 to each flask
STEP NO.5
Add Step-wise 5ml's Titrating soln RT-4 to one flask until blue color alters to red-Violet. Record Volume(A)
STEP NO.6
Fill each flask to 100 ml line with pure water and agitate.
STEP NO.7
Fill Comparator tube from flask No.2 and match to color Chart Value (B)
Computation:
PPm = F(100A-B) / Aliquot
PIPETTE
RT-1
RT-2
RT-3
RT-4
Comparator Tube

The amount of excess chelating agent used to counteract water hardness is determined by spectrophotometric means using Calcon as an indicator. The spectrophotometric means may be of laboratory scale or may be an empirical part of a field kit.

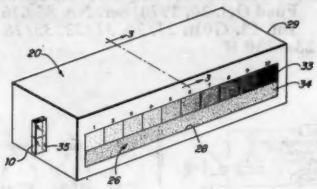
3,697,225
INDICATOR FOR THE DETECTION OF COBALT IONS
Dieter Schmitt, Alfred Stein, and Wilhelm Baumer, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung Patentabteilung, Darmstadt, Germany
No Drawing. Filed Mar. 9, 1971, Ser. No. 122,542
Claims priority, application Germany, Sept. 10, 1970, P 20 44 801.5
Int. Cl. C09k *3/00;* G01n *31/22*
U.S. Cl. 23—253 TP 21 Claims

An indicator for the colorimetric detection of cobalt ions is formed by impregnating an absorbent carrier with a composition comprising a water-soluble rhodanide salt, an alkali-metal or ammonium thiosulfate, an alkali metal fluoride and one or more of emulsifier and/or wetting agent, a tertiary amine and a quaternary ammonium salt.

3,697,226
HYDROCARBON DETECTOR SYSTEM
Tomas Hirschfeld, Framingham, and Noboru Matsu, Marblehead, Mass., assignors to Block Engineering, Inc., Cambridge, Mass.
Filed Apr. 29, 1971, Ser. No. 138,486
Int. Cl. G01m *21/38, 33/22*
U.S. Cl. 23—254 R 12 Claims

A system for detecting and quantitatively measuring the presence of unsaturated and aromatic hydrocarbons, particularly vapors of partially burned and residual unburned hydrocarbons in the exhaust emissions of gasoline internal combustion engines. The system includes a partially shielded membrane adapted to react with aromatic and

unsaturated hydrocarbons to produce derivatives having strong absorption characteristics in the ultraviolet region. There is also provided an ultraviolet fluorescence photometer including an ultraviolet source and a visible fluorescent screen between which the exposed membrane is introduced. The photometer includes a gray scale or step wedge for visually comparing the ultraviolet absorption in the



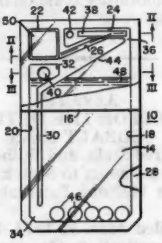
unshielded section of the membrane against a calibrated standard including the shielded section of the membrane and the gray scale.

3,697,227

CHEMICAL CONSTITUENT SAMPLER

Robert P. Goldstein, Forest Hills, and Frank R. Agnew, Penn Hills, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1966, Ser. No. 549,862
Int. Cl. G01n *31/00*
U.S. Cl. 23—253 TP **12 Claims**



A disposable sampler for testing for the presence of constituents in fluids comprising a laminated package having a base sheet and a retainer sheet, the sheets being composed of relatively impermeable materials, the base sheet having a fluid-holding chamber, the retainer sheet being applied to the base sheet and covering the chamber, detachable opening means leading to the chamber including a fluid inlet in one of the sheets, and a cover sheet detachably mounted on said sheet and covering the inlet in a fluid-tight manner.

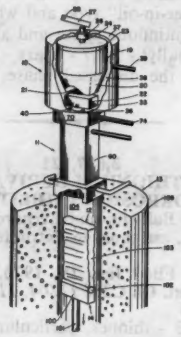
3,697,228

APPARATUS FOR GROWING CRYSTALS IN PLATE FORM

Joseph F. Wenckus, Needham, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 7, 1969, Ser. No. 797,556
Int. Cl. B01j *17/24*
U.S. Cl. 23—273 V **6 Claims**

Apparatus for growing crystals of such materials as sapphire, ruby, spinel and the like in strip or plate form by the Verneuil method. A plurality of spaced powder feed tubes, having means surrounding each one to supply a combustible mixture, are positioned to direct fused



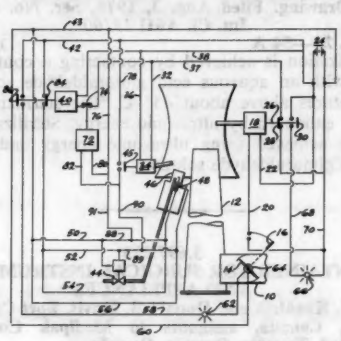
particles onto a boule to build up the crystal in an even continuous growth pattern.

3,697,229

AUTOMATIC IGNITION SYSTEM FOR FLARING WASTE COMBUSTIBLE GASES

Donald J. Frey, North Canton, and Warren P. Cpp, Simsbury, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 25, 1970, Ser. No. 75,542
Int. Cl. F23d *13/20*; F23q *9/08*
U.S. Cl. 23—277 C **3 Claims**



An automatic ignition system for flaring waste combustible gases being exhausted through a stack, which utilizes an ignitor burner which is automatically energized when gases are passed to the stack. A main flame scanner, ignitor burner scanner, and a timer are so interrelated that a safe, economical, and efficient operation is performed.

3,697,230

APPARATUS FOR POLYMERIZING LIQUIDS TO POLYMERS

Yoshihisa Fujimoto, Yoshio Kimura, Iwao Terasaki, and Takanobu Kitago, Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Kita-ku, Osaka, Japan

Original application Apr. 21, 1969, Ser. No. 817,938, now Patent No. 3,609,124, dated Sept. 28, 1971. Divided and this application July 13, 1970, Ser. No. 61,044
Int. Cl. C08g *17/01*
U.S. Cl. 23—283 **4 Claims**

A polymerization vessel comprises a vertical series of reaction chambers each having bottom and side walls. An inlet connected to the top chamber supplies polym-

erizable liquid and an outlet is connected to the lowest chamber to discharge polymer product. Connecting tubes connect a chamber with the chamber immediately below it. Each connecting tube has its upper end above the bottom wall of a chamber located thereabove; and has its

lower end directed at an angle to the surface of the polymerizable liquid and located near the wall of the reaction vessel. A jet stream of vapor from the lower end of the tube flows along the inside surface of the chamber and then strikes the surface of the liquid to impart a rotating movement to the liquid.

3,697,231

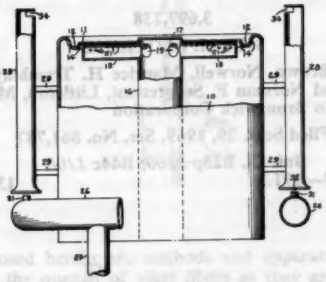
BURNER ASSEMBLY FOR FLARE STACK

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Dec. 23, 1970, Ser. No. 101,030

Int. Cl. F23d *13/20*

U.S. Cl. 23—277 C 10 Claims



A burner assembly for the upper end of a flare stack designed for the combustion of gases at significant elevations above the surrounding terrain wherein a smoke suppressant is thoroughly mixed with the gas prior to the burning reactions and to a structural arrangement which distributes the smoke suppressant in volumes proportional to the quantity of the gases to be burned.

3,697,232

PREPARATION OF POTASSIUM CYANOBOROHYDRIDE

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

No Drawing. Filed June 16, 1969, Ser. No. 833,766

Int. Cl. C01b *6/14, 35/00;* C01c *3/08*

U.S. Cl. 23—358 1 Claim

The invention relates to the preparation of potassium cyanoborohydride. This compound is prepared by mixing substantially anhydrous hydrogen cyanide with a substantially anhydrous potassium borohydride at a temperature between 0° C. and 100° C. in substantially anhydrous dimethylformamide at atmospheric pressure. If desired to avoid loss of hydrogen cyanide, a pressure of from about 1 to 5 pounds per square inch may be used. Preferably, the preparation is carried out in two stages (1) initially at a temperature between about 10° C. to about 35° C. until substantially all hydrogen has ceased to be evolved, and (2) then at a temperature between about 35° C. and the boiling point of the solvent until all the intermediate products have been converted to the desired cyanoborohydride.

3,697,233

CLARIFYING AMMONIUM PHOSPHATE SOLUTIONS USING ATTAPULGITE AND BENTONITE

Alvin W. Peck, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,048

Int. Cl. B01d *21/01;* C01b *25/28*

U.S. Cl. 23—293 R 2 Claims

A method of clarifying phosphate solutions, containing extraneous suspended matter introduced with the phosphoric acid employed in their manufacture, by the use of clay.

3,697,234

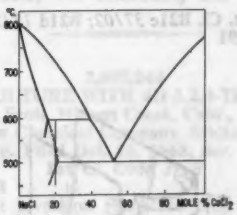
PURIFICATION OF IMPURE SOLID NaCl BY COUNTER-CURRENT CONTACT WITH MOLTEN NaCl

Charles F. Bonilla, Tenafly, N.J., assignor to Barry F. Haskett, New York, N.Y., and Joan Hixon Martin, Washington, D.C., a fractional part interest to each

Filed Mar. 14, 1969, Ser. No. 807,375

Int. Cl. B01d *11/02*

U.S. Cl. 23—312 AH 11 Claims



A process for the purification of salt and other fusible materials which comprises washing a finely ground impure material, e.g., sodium chloride, with a counter-current flow of a smaller molten stream of the same material at high purity (e.g., a portion of the purified final product

of the process). The outlet temperature of the feed material is preferably kept just below the melting point of the same, the inlet temperature being selected in accordance with the impurities to be removed, such temperature being generally slightly above 720° C. in the case of sodium chloride.

3,697,235

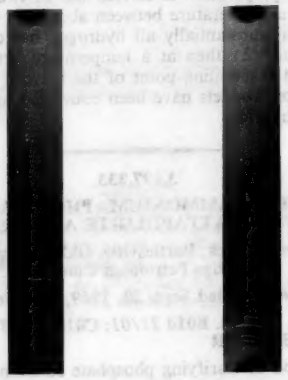
METHOD OF PURIFYING URANIUM HEXAFLUORIDE BY REDUCTION TO LOWER URANIUM FLUORIDES

Pearl R. Ogle, Jr., Chillicothe, Ohio, assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 31, 1960, Ser. No. 19,132

Int. Cl. C01g *43/06*

U.S. Cl. 23—346 16 Claims



The invention relates to the purification of uranium hexafluoride contained in gaseous mixtures by reduction to lower uranium fluorides through formation of an intermediate compound having the empirical formula $UF_6N(O)_x$, where x is a number from 1 to 2.

3,697,236

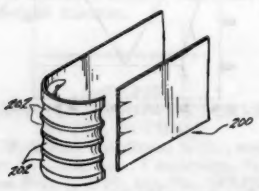
COMBINATION TUBE FORM BEND AND INFLATION APPLICATION

Richard A. Shive, Alton, Ill., assignor to Olin Corporation

Original application Feb. 26, 1969, Ser. No. 823,220, now abandoned, which is a division of application Ser. No. 709,636, Mar. 1, 1968, now Patent No. 3,545,394. Divided and this application Aug. 13, 1970, Ser. No. 63,427

Int. Cl. B21c *37/02*; B21d *11/20*

U.S. Cl. 29—191 5 Claims



A metal strip having at least one inflatable fluid passageway sandwiched within it and containing at least one groove in substantial correspondence to the inflatable passageway extending intermediate the ends of the strip. The groove is in the bend area of the strip. Preferably the strip is bent in the bend area at least 25° and the bend radius is less than 1 inch. In the most preferred embodiment the inflatable passageway corresponds to a pattern of stop-weld material.

3,697,237

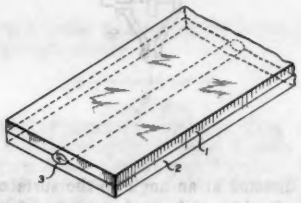
COMPOSITE METAL COIN

Richard Seiz, Bruchkobel, Germany, assignor to W. C. Heraeus GmbH, Hanau am Main, Germany

Filed Dec. 29, 1970, Ser. No. 102,349

Int. Cl. A44c *21/00*; G07f *1/06*

U.S. Cl. 29—191 13 Claims



Composite metal coin including one or more wire-like elements of a magnetic metal or alloy disposed between two plate-like elements of a non-magnetic coin metal or alloy or a weak magnetic metal or alloy as compared to the wire-like element, the plate-like elements surrounding the wire-like element and being joined at their interface, and the wire-like element extending from edge to edge of the coin. A metallic coating can also be applied as by electroplating to the exterior of the plate-like elements.

3,697,238

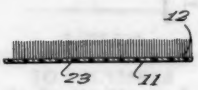
METAL FLOCKING

Perry H. Brown, Norwell, Maurice H. Tremblay, Westboro, and Norman F. Surprenant, Littleton, Mass., assignors to Brunswick Corporation

Filed Sept. 29, 1969, Ser. No. 861,787

Int. Cl. B23p *3/00*; B44c *1/08*

U.S. Cl. 29—191.2 13 Claims



A flocked fabric wherein metal flock fibers are secured to a base. The fibers may be secured as by adhesive, metal fusion bonding, etc. The flock fibers may be metal fusion bonded to each other, may be maintained in spaced relationship, may be provided in tufts, etc.

3,697,239

LITHIUM CONTAINING FUEL SUITABLE FOR PRODUCING CALORIFIC ENERGY BY REACTION WITH SF_6

Johann Schröder, Aachen, Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 860,978
Claims priority, application Netherlands, Sept. 30, 1968, 6813991
Int. Cl. F24j *1/00*
U.S. Cl. 44—3 R 4 Claims

A lithium and calcium containing fuel producing calorific energy by reaction with sulfur hexafluoride.

3,697,240

AEROSOL BOMB FILLED WITH STARTING AGENT FOR DIESEL ENGINE

Shojiro Hori, Yokosuka, and Hisao Maruta, Kashiwa, Japan, assignors to Kashiwa Asechiren Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Nov. 24, 1970, Ser. No. 92,502
Claims priority, application Japan, Apr. 21, 1970, 45/33,488
Int. Cl. C10l *1/18*
U.S. Cl. 44—52 3 Claims

A starting agent of the aerosol-type to be jetted into a combustion chamber of a diesel engine to aid in starting the engine in a cold climate contains diethyl ether, dimethyl ether and n-butyl alcohol as main components.

3,697,241

METHOD AND APPARATUS FOR PROVIDING CONTROLLED QUENCH IN THE MANUFACTURE OF FIBER GLASS

Edward T. Strickland and Homer C. Amos, Palm Springs, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 14, 1969, Ser. No. 790,933
Int. Cl. C03b *37/02*
U.S. Cl. 65—2 14 Claims

Disclosed herein are methods and apparatus for controlling the quench of glass fibers as they are extruded. A fluid, such as air, is caused to flow evenly with controlled impingement at the roots of fibers as they are being extruded from a bushing, and/or a controlled temperature environment is provided along the extruding cone of fibers. With either or both approaches small fibers with greatly reduced breakage can be produced. Several embodiments of the present concepts are disclosed wherein a manifold device is used at the bushing to provide a controlled even flow of air at the roots of the extruding fibers, and wherein a chamber may be used along a length of the drawn fibers to provide a controlled environment and to reduce the stress in such fibers during attenuation.

3,697,242

STRENGTHENING BOROSILICATE GLASS BY CROWDING SURFACE LAYER WITH LiOH AND/OR KOH

Francis J. Shonebarger, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,071
Int. Cl. C03c *15/00*; C03b *27/00*
U.S. Cl. 65—30 18 Claims

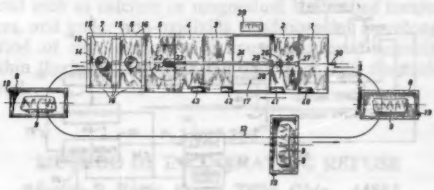
Glass articles are strengthened by "crowding" or "stuffing" molecules of the hydroxide of lithium and/or potassium into a surface zone of the glass network. The crowding of the surface zone is accomplished by molecular migration rather than by ion exchange, and must be carried out at an elevated temperature which is below the strain point of the glass. The process is especially useful as a means of strengthening commercial borosilicate glasses which are generally difficult to strengthen significantly by ion exchange, and it can also be used to strengthen soda-lime and other glasses.

3,697,243

FURNACE FOR HEATING AND BENDING GLASS PLATES FOR WINDSHIELDS AND THE LIKE

Arvi Artama, Artama Laukontori 4C, Tampere, Finland

Filed Aug. 17, 1970, Ser. No. 64,342
Int. Cl. C03b *23/02*
U.S. Cl. 65—273 11 Claims



A furnace for heating and bending glass plates, particularly windshields of motor vehicles, wherein the glass plates are loaded on bending forms in form carriers which are moved successively into and out of the furnace, comprising successive heating and cooling chambers, including a movable preheating chamber and a main heating chamber, the two latter being arranged separately from each other, there being formed a space between two successive chambers (preferably the preheating and the main heating chambers) for controlling and adjusting purposes.

3,697,244

CROP CULTURE WITH 4H-1,2,4-TRIAZOLES

Henry H. Scott, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,851
Int. Cl. C05g *3/08*
U.S. Cl. 71—1 4 Claims

The present invention relates to crop culture and is particularly concerned with practices for conserving soil nitrogen and for supplying the requirements for plant nutrition. These practices involve the employment, as active agent, of 4-amino-4H-1,2,4-triazole, 3,4-diamino-4H-1,2,4-triazole or a mineral acid addition salt of these compounds. Useful compositions employing such compounds are also disclosed. Typical compositions comprise a reduced nitrogen fertilizer and a triazole compound.

3,697,245

COATED FERTILIZER

Joseph T. Dilday, 3971 Glenmere Road, North Little Rock, Ark. 72116

No Drawing. Original application Apr. 16, 1969, Ser. No. 816,808. Divided and this application Aug. 12, 1970, Ser. No. 63,315

Int. Cl. C05c *9/00*

U.S. Cl. 71—28 3 Claims

Tenacious coatings of fertilizer supplements are applied to granular high analysis fertilizers, by adding, in order, minor amounts of mineral oil and of aqueous calcium lignosulfonate and then substantial amounts of fertilizer supplements, maintaining the granules in motion during and after each addition until the added material uniformly coats the granules.

3,697,246

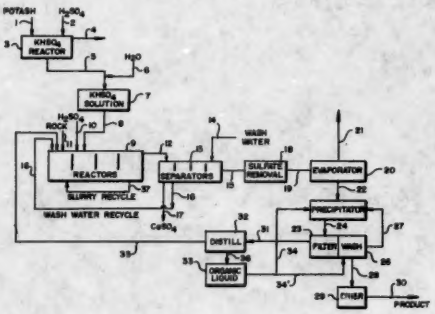
POTASSIUM PHOSPHATE MANUFACTURE

Erhart K. Drechsel, Houston, Tex., and John B. Sardisco and James R. Stewart, Jr., Shreveport, La., assignors to Pennzoil United, Inc., Houston, Tex.

Filed Oct. 16, 1970, Ser. No. 81,280

Int. Cl. C05b *7/00*

U.S. Cl. 71—34 17 Claims



Fertilizer materials, especially potassium dihydrogen phosphate, are produced by the reaction of phosphate rock or a solubilized form thereof, such as mono calcium phosphate, dicalcium phosphate, etc., concentrated sulfuric acid, potassium hydrogen sulfate and, optionally fresh or recycle phosphoric acid, the resulting mixture is filtered to remove the calcium sulfate precipitate and the potassium dihydrogen phosphate is recovered from the filtrate, either by concentration and filtration or by extraction with an organic solvent.

3,697,247

ELIMINATION OF MAGNESIUM GELS IN LIQUID AND SUSPENSION FERTILIZERS DERIVED FROM WET ACID

Thomas M. Jones, Sheffield, and Alva W. Frazier, Florence, Ala., assignors to Tennessee Valley Authority

No Drawing. Continuation of application Ser. No. 81,591, Oct. 16, 1970, now Defensive Publication T889,024. This application Apr. 1, 1971, Ser. No. 130,488

Int. Cl. C05b *7/00*

U.S. Cl. 71—34 7 Claims

A method for preventing formation of or destroying strong resinous-like gels in liquid and suspension fertilizer products resulting from the ammoniation of wet-process orthophosphoric acids containing relatively high magnesium and low aluminum congeneric impurities as well as polyphosphates either added thereto or formed in situ therein in such a manner as not to substantially delete the congeneric fluorine impurities content level. The method consists of adding aluminum as a soluble compound to the wet-process acid to increase the weight ratio Al_2O_3:MgO to at least about 1. Typically, wet acids prepared from North Carolina rock as well as some western rock, unless specially treated, display a weight ratio Al_2O_3:MgO of less than 1 and usually in the range from about 0.5 to about 0.8.

3,697,248

RECOVERY OF SULPHUR DIOXIDE (SO_2) FROM GAS STREAMS AND PRECIPITATION OF ALUMINUM FLUORINE PRODUCT

Anson G. Betts, Plainfield, Mass. (West Cummington, Mass. 01265)

No Drawing. Continuation-in-part of application Ser. No. 559,371, June 16, 1966, which is a continuation-in-part of application Ser. No. 361,207, Apr. 20, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 153,741, Nov. 21 1961, now abandoned, which in turn is a continuation-in-part of application Ser. No. 768,554, Oct. 21, 1958, now abandoned. This application Dec. 31, 1970, Ser. No. 103,307

Int. Cl. C05b *11/14*

U.S. Cl. 71—38 7 Claims

In this invention a fluoriferous calcium phosphate mineral of the group which includes phosphate rock, apatite, aluminous phosphate, and a concentrate of any of them, suitably in finely-particled condition, is used in an aqueous suspension to combine with sulphur dioxide (SO_2) of a gas stream resulting from combustion of a sulphur-containing substance, for example, of coal or other fuel. The mixture is then reacted with aluminum compounds to precipitate an aluminum fluorine product from the fertilizer product.

3,697,249

SUBSTITUTED s-TRIAZINE FORMALDEHYDE ADDUCTS USEFUL AS HERBICIDES

Rodney L. Wells, Chester, Harry E. Ulmer, Hopewell, and Paul J. Mason, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 10, 1969, Ser. No. 884,000

Int. Cl. A01n *9/22*

U.S. Cl. 71—93 1 Claim

Novel 2-alkylamino-4-amino-6-chloro-s-triazine-formaldehyde adducts are prepared by reacting a 2-alkylamino-4-amino-6-chloro-s-triazine with formaldehyde in an inert organic solvent using an alkaline catalyst. Reaction temperatures of 60 to 80° C. for one to three hours are preferred. The reaction mixture may be cooled to separate the product; evaporation of the solvent at advanced temperatures should be avoided as this may cause formation of by-products. The products are highly selective herbicides.

3,697,250

METHOD OF DESUCKERING TOBACCO PLANTS

David W. Young, Homewood, and Jerry A. Dieter, Park Forest, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Dec. 3, 1969, Ser. No. 881,910

Int. Cl. A01n

U.S. Cl. 71—78 9 Claims

A method of improving plant health by applying horticultural chemicals is disclosed. The horticulturally-active compounds are esters of styrene-maleic anhydride copolymers and both of a lower alkoxy polyethylene gly-

col and an alkanol containing about 8 to 24 carbon atoms. The method is useful, for instance, for combatting tobacco sucker formations.

3,697,251

PYRIDINES AND PHYTOTOXIC COMPOSITIONS

Frank Long, Llangollen, and Kamal Naguib Ayad, Wrexham, Wales, assignors to Monsanto Chemicals Limited, London, England

No Drawing. Original application June 30, 1967, Ser. No. 650,176, now Patent No. 3,555,031, dated Jan. 12, 1971. Divided and this application Mar. 23, 1970, Ser. No. 24,921.

Claims priority, application Great Britain, July 6, 1966, 30,295/66

Int. Cl. A01n *9/22*

U.S. Cl. 71—94 2 Claims

Substituted-pyridines selected from the group consisting of

(1) a pyridine base,
(2) acid addition salts of (1),
(3) quaternary ammonium salts of (1), and
(4) N-oxides of (1),

said pyridine base having at least one aromatic group as a substituent in the pyridine nucleus and at least one other substituent in the pyridine nucleus selected from the group consisting of halogen, cyano, amino, acylamino, hydroxyl, mercapto, aliphatic, aliphatic-oxy, aliphatic-thio and aliphatic sulphonyl groups, provided that when the pyridine nucleus contains both a chlorine atom and a cyano group an aromatic group is present in an α- or β-position of the pyridine nucleus and further provided that when the pyridine nucleus contains an aliphatic group, there is also present in the pyridine nucleus at least one additional substituent selected from the said other substituents.

Utility as phytotoxicants.

3,697,252

PHYTOTOXICANT

Paul J. Stoffel, Creve Coeur, and David J. Beaver, Richmond Heights, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 8, 1969, Ser. No. 883,297

Int. Cl. A01n *9/22*

U.S. Cl. 71—95 6 Claims

It has been found that N-(3,4 - dichlorocarbanilino) succinimide is useful as a phytotoxicant in the control of noxious plant life.

3,697,253

PLANT GROWTH REGULATION

Robert R. MacMurray, 21 Colonial Ave., Haddonfield, N.J. 08033

No Drawing. Filed Apr. 11, 1969, Ser. No. 815,493

Int. Cl. A01n *9/00, 9/24*

U.S. Cl. 71—97 22 Claims

Plant growth regulant compounds and compositions, particularly stimulants, containing N,N-di-n-propyl-4-trifluoromethyl-2,6-dinitroaniline generically named trifluralin or cacodylic acid and its salts or combinations thereof with each other and with 2,4-dichlorophenoxyacetic acid and/or 2,4,5-trichlorophenoxyacetic acid and methods of using these compounds and compositions to stimulate plant growth and stimulate and increase crop yield and adjust fruiting time.

3,697,254

DECAFLUOROBENZHYDROL AS A SELECTIVE HERBICIDE

David Thomas Saggers, Saffron Walden, England, assignor to Fisons Pest Control Limited, Harston, Cambridgeshire, England

No Drawing. Filed May 6, 1968, Ser. No. 727,033

Claims priority, application, Great Britain, May 16, 1967, 22,558/67

Int. Cl. A01n *9/24*

U.S. Cl. 71—122 3 Claims

Decafluorobenzhydrol possesses herbicidal activity and is particularly useful as a selective herbicide, especially for the selective control of crabgrass.

3,697,255

SCRAP TANTALUM RECLAMATION PROCESS

Wiley M. Baldwin, Winston-Salem, N.C., and Edward O. Fuchs, Union, Donald J. Sharp, Trenton, and James H. Swisher, Stirling, N.J.; said Baldwin and said Sharp assignors to Western Electric Company, Incorporated, New York, N.Y., said Fuchs and said Swisher assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Nov. 17, 1970, Ser. No. 90,250

Int. Cl. C22b *7/00, 51/00;* C22c *1/06*

U.S. Cl. 75—.5 AB 16 Claims

Scrap tantalum bodies having impurities therein are reclaimed as substantially pure tantalum metal by a process which includes immersing the bodies in a molten metal such as calcium or magnesium at elevated temperatures, and under non-oxidizing conditions for a prolonged period of time sufficient to cause entrapped impurities within the body to diffuse out and react with the molten metal.

3,697,256

METHOD OF INCINERATING REFUSE

Isaiah B. Engle, Rte. 3, Tiffin, Ohio 44883

Filed Feb. 8, 1971, Ser. No. 113,167

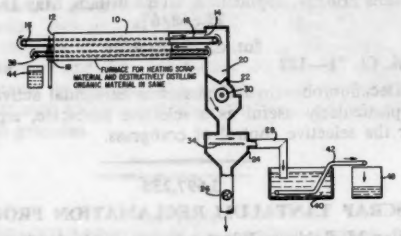
Int. Cl. F23g *5/02;* C21b *15/00;* C22b *7/00*

U.S. Cl. 75—40 7 Claims

A method and apparatus for incinerating solid refuse in which large amounts of useful by-products are recovered and which is substantially air pollution free. The incinerator includes a feed-shaft, a combustion chamber including a low temperature, medium temperature and high temperature zone having a reducing atmosphere, and a chemical reaction zone having an oxidizing atmosphere. Unsorted refuse along with selected additives are placed into the incinerator on top of a coke-bed in the high temperature zone. During incineration, distillates from low temperature pyrolysis in the low temperature zone, and high temperature pyrolysis in the medium temperature zone, are withdrawn through condensers. A variable speed fan operably exhausting the chemical reaction zone is operated to create a neutral pressure point between the medium temperature and the high temperature zone whereby the pyrolysis distillates may be easily separated from a stream of high temperature volatiles and CO produced in the high temperature zone.

The stream of air blowing across the refuse carries the high temperature volatiles into the chemical reaction zone. The chemical reaction zone has a checker-wall constructed of various reactive bricks so that the volatiles react with the bricks to form basic and acidic slag oxides. The slag oxides condense and flow into the hearth of the high temperature zone. Molten iron collects in the interstices of the coke-bed and is removed by casting.

3,697,257
SCRAP RECOVERY PROCESS
John E. Perry, Bay Village, Ohio, assignor to Horizons Research Incorporated
Filed Nov. 7, 1969, Ser. No. 874,891
Int. Cl. C22b *25/06*
U.S. Cl. 75—64 6 Claims



The recovery of metal values in scrap materials by destructive distillation removal of organic non-metal materials, at temperatures which leave the metal relatively unaffected.

3,697,258
HIGHLY CORROSION RESISTANT MARAGING STAINLESS STEEL
Stephen Floreen, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed Oct. 13, 1969, Ser. No. 865,962
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 B 12 Claims

A maraging stainless steel containing correlated amounts of nickel, chromium, cobalt, silicon and metal from the group consisting of aluminum and titanium, the steel being particularly suitable in cast form since it affords a combination of good strength, toughness and high corrosion resistance and also exhibits excellent foundry characteristics.

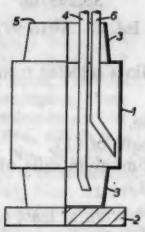
3,697,259
FLUXLESS ALUMINUM BRAZING COMPOSITION
William J. Werner, Clinton, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Oct. 2, 1970, Ser. No. 77,762
Int. Cl. C22c *33/100*
U.S. Cl. 75—134 N 3 Claims

This disclosure relates to a fluxless brazing alloy for use in forming brazed composites made from members of aluminum and its alloys, said brazing alloy consisting of, in weight percent, 35–55 percent aluminum, 10–20 percent silicon, 25–60 percent germanium; 65–88 percent aluminum, 2–20 percent silicon, 2–18 percent indium; 65–80 percent aluminum, 15–25 percent silicon, 5–15 percent yttrium.

3,697,260
ALUMINUM CONDUCTOR WIRE
Harold Y. Hunsicker, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
No Drawing. Filed Dec. 30, 1969, Ser. No. 889,315
Int. Cl. C22c *21/00*; C22f *1/04*
U.S. Cl. 75—139 11 Claims

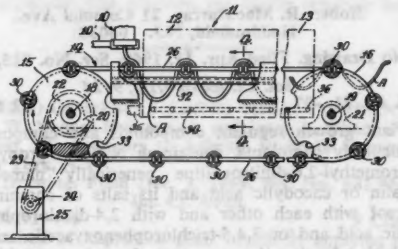
Improved aluminum wire generally ranging from 16 to 24 gauge (0.050 to 0.020 inch diameter), particularly useful in telephone cable and similar applications, contains careful additions to aluminum of magnesium, copper, nickel and iron and is fabricated by steps which impart to the wire a controlled amount of strain hardening. The improved wire exhibits the delicate balance of properties, including strength, ductility, bendability, electrical connection stability and electrical conductivity, to make it highly suitable for telephone service.

3,697,261
MANUFACTURE OF CYLINDRICAL BODIES FROM METAL POWDER
Peter Alexander Edward Jump, Bushey, and Barclay Keegan, Doncaster, England, assignors to Davy and United Engineering Company Limited, Sheffield, England
Filed Mar. 25, 1970, Ser. No. 22,424
Claims priority, application Great Britain, Apr. 2, 1969, 17,287/69
Int. Cl. B22f *5/00*
U.S. Cl. 75—208 R 9 Claims



A generally cylindrical body such as the roll for a rolling mill or calender is manufactured from at least two metallic powders. The powders are introduced into different parts of a thin-walled mould and the mould and the powder therein are compacted to compact the powder into a solid body and the compacted powder is sintered. It is preferable for one of the powders introduced into the mould to constitute a core which is surrounded by the other powder or powders. To introduce the powders into the mould it is preferred for the mould to be rotated about its longitudinal axis with one of the powders introduced into the mould to form a layer on the inner longitudinally extending wall of the mould and the second powder is introduced into the mould to form the core. The compaction process may be a hot or cold isostatic compaction process.

3,697,262
METHOD OF HANDLING SHRINKABLE MATERIAL
James M. Fenner, Niles, Mich., assignor to National-Standard Company, Niles, Mich.
Continuation-in-part of abandoned application Ser. No. 807,391, Mar. 14, 1969. This application Jan. 15, 1971, Ser. No. 106,787
Int. Cl. B22f *1/00*
U.S. Cl. 75—214 8 Claims



The method of conveying an elongated component which is characterized by being shrinkable upon heating

thereof through a heat treating furnace in which the elongated component is formed into sinuous configuration and conveyed in that configuration through the heat treating furnace.

3,697,263

METHOD OF CLEANING RESIDUAL LIQUID DEVELOPER FROM ELECTROPHOTOGRAPHIC PLATES

Joseph Mammino, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed Oct. 31, 1969, Ser. No. 873,103
Int. Cl. G03g 13/22
U.S. Cl. 96—1.4 11 Claims

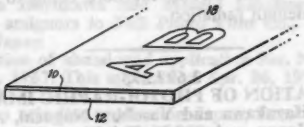
In liquid development systems, cycling electrostatographic imaging surfaces are substantially completely cleaned of developer remaining on the surface after transfer to copy paper by cyclically contacting the imaging surface with a small quantity of highly absorbent dry powder and removing the powder from the imaging surface after the powder has absorbed the residual liquid developer.

3,697,264

NOVEL PHOTOCONDUCTIVE CARBAZOLE POLYMERS AND PHOTOCONDUCTIVE ELEMENTS EMBODYING SAME

Richard M. Podhajny, 914 W. Margate Terrace, Chicago, Ill. 60640

Filed Mar. 2, 1970, Ser. No. 15,736
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 8 Claims



This invention is addressed to novel substituted N-vinyl carbazole polymers and copolymers and to the preparation of an electrophotographic element having a photoconductive layer formulated of same.

3,697,265

VITREOUS SELENIUM ALLOY MATRIX CONTAINING ISOLATED PARTICLES AND PARTICLE NETWORKS OF RESIN

Leon A. Teuscher, Webster, Michael P. Trubisky, Fairport, Frank M. Palermiti, Pittsford, and Charles J. Levine, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 25, 1969, Ser. No. 836,560
Int. Cl. G03g 5/04, 5/08
U.S. Cl. 96—1.5 20 Claims

A xerographic plate having a novel photoconductive layer comprising a major portion of a vitreous selenium alloy blended with a minor portion of an insulating resin in the form of isolated particles and/or a partial resin network surrounded by a vitreous selenium alloy matrix.

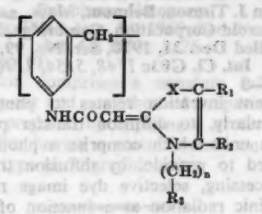
3,697,266

ORGANIC PHOTOCONDUCTIVE MATERIALS FOR ELECTROPHOTOGRAPHY

Hisatake Ono, Chiakai Osada, Syu Watarai, and Harumi Katsuyama, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,881
Claims priority, application Japan, Dec. 30, 1969, 45/1,635
Int. Cl. G03g 5/00; H01l 13/00
U.S. Cl. 96—1.5 3 Claims

An electrophotographic material comprising an electroconductive layer having coated thereon a layer containing a polymer of a compound of the following general formula,



wherein X is an atom or atomic group of atoms necessary for completing a heterocyclic ring, R_1 and R_2 are each a hydrogen atom, an alkyl group or an aryl group, R_3 is a hydrogen atom, alkoxyl group, cyano group or phenyl group, and n is an integer having the value of 1–4, and the aforementioned R_1 and R_2 may, in combination, form an unsubstituted or substituted arylene group.

3,697,267

SENSITIZABLE COATED PAPER SHEET ADAPTED FOR PHOTOELECTROSTATIC REPRODUCTION

Jay J. Uber, 67 Hitchcock St., Holyoke, Mass. 01040, and Johan F. Dirks, 12 Grandview St., South Hadley Falls, Mass. 01075

Continuation of application Ser. No. 541,866, Jan. 27 1966, which is a continuation-in-part of application Ser. No. 162,657, Dec. 28, 1961. This application Mar. 7, 1967, Ser. No. 621,365
Int. Cl. G03g 5/00; C03c 5/00; D21h 5/00
U.S. Cl. 96—1.8 8 Claims

A photosensitive paper sheet which is useful in an electrophotographic process wherein a liquid toner is employed, said sheet having a coating on one side thereof which comprises a finely divided, photoconductive, inorganic pigment dispersed in a film-forming, electrically insulating binder material, and a coating on the other side thereof which acts as a barrier coat, to prevent retention of the liquid toner on the back of the sheet. A photosensitive paper sheet having a barrier coating on both sides thereof is also disclosed.

3,697,268

ELECTROSTATIC PRINTING METHOD

Wasaburo Ohta, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Apr. 9, 1969, Ser. No. 814,547
Claims priority, application Japan, Apr. 10, 1968, 43/23,888
Int. Cl. G03g 5/04, 5/06, 5/08, 9/02, 13/06, 13/18
U.S. Cl. 96—1 R 2 Claims

An electrostatic printing method and device therefor comprising the steps of (1) forming an electrostatic latent image upon a conductive photoreceptor by an electronic photography, (2) developing said image with an electrically insulating and water repellent developing agent and fixing the developed image if necessary, (3) rendering non-image portions (that is the portions having no developing agent attached thereto) hydrophilic with a hydrophilic agent after said fixing, (4) rendering said hydrophilic portions electrically conductive with a conducting agent, (5) electrically charging the electrostatic printing plate, thus obtained thereby binding the charge upon the electrically chargeable or charge retainable and water repellent image portion, (6) transferring said charge upon an electrically insulating body, thereby forming an electrostatic latent image, and (7) developing said electrostatic latent image and if necessary fixing said image thus developed.

Representative figures: FIGS. 6, 7 and 8.

3,697,269
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES
William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 21, 1970, Ser. No. 99,970
Int. Cl. G03c 1/48, 5/54, 1/40
U.S. Cl. 96—3 28 Claims

The present invention relates to photography and, more particularly, to diffusion transfer process photographic film units which comprise a photosensitive element adapted to provide, by diffusion transfer photographic processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of essential layers including a direct negative photosensitive silver halide layer comprising photosensitive silver halide grains the majority of which possess a substantially uniform grain size within the range of ~0.5 to 3.0μ having associated therewith dye image-forming material which is diffusible during processing as a function of the point-to-point degree of silver halide layer exposure to incident actinic radiation and a layer adapted to receive image-forming material diffusing thereto; and to specified diffusion transfer processes employing such film units.

3,697,270
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES
William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 21, 1970, Ser. No. 99,971
Int. Cl. G03c 1/40, 1/48, 5/54
U.S. Cl. 96—3 29 Claims

The present invention relates to photography and, more particularly, to diffusion transfer process photographic film units which comprise a photosensitive element adapted to provide, by diffusion transfer photographic processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of essential layers including a direct negative photosensitive silver halide layer having associated therewith dye image-forming material which is diffusible during processing as a function of the point-to-point degree of silver halide layer exposure to incident actinic radiation and comprising a plurality of photosensitive silver halide dispersions which comprise silver halide grains, the majority of which possess a substantially uniform grain size and which dispersions taken together possess a mean particle size within the range of ~0.5 to 3.0μ and a layer adapted to receive image-forming material diffusing thereto; and to specified diffusion transfer processes employing such film units.

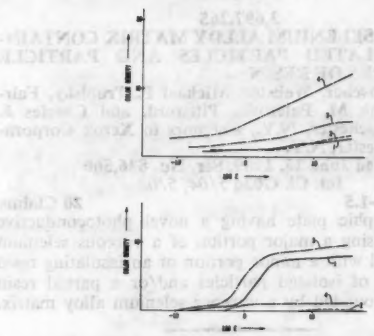
3,697,271
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES FOR COLOR DIFFUSION TRANSFER UTILIZING SILVER HALIDE EMULSIONS WITH SPECIFIC PROPORTIONS OF AVERAGE HALIDE GRAIN SIZE
William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 16, 1971, Ser. No. 134,773
Int. Cl. G03c 1/48, 5/54, 7/00
U.S. Cl. 96—3 31 Claims

The present invention relates to photography and, more particularly, to diffusion transfer process photographic film units which comprise a photosensitive element adapted to provide, by diffusion transfer photographic processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of essential layers including a photosensitive silver halide layer, comprising photosensitive silver iodochlorobromide which contain in terms of the halide thereof, by weight, not substantially in excess of about 5% iodide and about 10% chloride with bromide sufficient to provide 100%, the grains of the layer preferably possessing a mean particle size within the range of about 0.3 to 3.0μ, having associated therewith dye image-forming material which is diffusible during processing as a function of the point-to-point degree of silver halide layer exposure to incident actinic radiation and a layer adapted to receive dye image-forming material diffusing thereto; and to specified diffusion transfer processes employing such film units.

3,697,272
PROCESS FOR MAKING NON-SILVER FREE RADICAL FILM IMAGES VISIBLE
Lothar Ramins, Cleveland, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated
No Drawing. Filed June 18, 1971, Ser. No. 154,609
Int. Cl. G03c 5/04
U.S. Cl. 96—27 5 Claims

An improvement over the optical development procedure disclosed in United States Patent 3,510,300 which resides in the use of two separate exposures to radiation of two different wavelengths to develop a visible image from a latent image bearing material, the first exposure being a brief exposure to radiation of relatively shorter wavelength and the second exposure being to relatively longer wavelength radiation.

3,697,273
FORMATION OF PHOTOGRAPHIC IMAGES
Yoshihide Hayakawa and Yasuhiro Noguchi, Asaka-shi, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 21, 1969, Ser. No. 817,520
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 24 Claims



Vinyl or vinylidene polymer images are formed in conformance with a photographic latent image by developing a silver halide emulsion layer in the presence of a vinyl or vinylidene monomer using a reducing agent which initiates polymerization as a result of the development of the silver halide. The specific improvement comprises developing the emulsion layer in a solution containing both reducing agent (A) and a developing agent containing a structure represented by the following formula:

$$B-(C=C)_n-B'$$

The foregoing moieties are defined in the specification. The amount of developing agent is less than 1/100 mole per mole of reducing agent (A). An alternative embodiment comprises preliminarily developing the silver halide emulsion layer with a developing agent having the above general formula, and then conducting development and polymerization with reducing agent (A).

3,697,274
MATERIAL AND PROCESS FOR THE PREPARATION OF PRINTING PLATES

Heinz Herrmann, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Continuation of application Ser. No. 500,486, Oct. 14, 1965. This application Sept. 16, 1969, Ser. No. 860,161

Claims priority, application Germany, Oct. 15, 1964, K 54,270

Int. Cl. G03f *7/02*

U.S. Cl. 96—36.3 **5 Claims**

This invention relates to a presensitized printing plate comprising a base material having a coating thereon comprising a solvent-soluble, acid-curable amine-formaldehyde resin and a light-sensitive organic halogen compound in which chlorine, bromine, or iodine is attached to carbon.

3,697,275
PROCESS FOR POLYMERIZING VINYL COMPOUNDS

Yoshihide Hayakawa and Masato Satomura, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of abandoned application Ser. No. 643,978, June 6, 1967. This application Apr. 26, 1971, Ser. No. 137,718

Claims priority, application Japan, June 6, 1966, 41/36,388

Int. Cl. G03c *1/68, 5/00*

U.S. Cl. 96—48 R **5 Claims**

A process for polymerizing vinyl monomers. The initiation of the polymerization is caused by intermediate compounds formed during the development of photographic silver halide emulsions by certain phenolic reducing agents in the presence of vinyl monomers. The suitable phenolic compounds are resorcinol, m-aminophenol and their derivatives. Thus, a photographic image consisting of polymeric material can be formed corresponding to the photographic latent image produced in the emulsion. The polymerization is promoted by the presence of sulfite iron.

3,697,276
POLYVINYLCARBAZOLE PHOTOGRAPHIC SYSTEMS

James M. Lewis, Aurora, and John E. Shirey, Bedford, Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated

No Drawing. Continuation-in-part of abandoned application Ser. No. 20,052, Mar. 16, 1970, and applications Ser. No. 28,548 and Ser. No. 28,558, both Apr. 14, 1970. This application Feb. 1, 1971, Ser. No. 111,649

Int. Cl. G03c *1/72, 5/24*

U.S. Cl. 96—48 **21 Claims**

Compositions suitable for photographic duplication and reproduction either by projection or contact printing, the compositions comprising at least one N-vinyl monomer, such as N-vinylcarbazole, dispersed in polyvinylcarbazole along with a free radical source, such as iodoform, and the procedures whereby such compositions are utilized.

3,697,277
NONGLARE PHOTOGRAPHIC PRINTS

Frank O. King, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,122

Int. Cl. G03c *5/26*

U.S. Cl. 96—50 PL **9 Claims**

The invention comprises a nonglare reflective type photographic print and a method of preparing the same. The article is prepared by applying a protective coating of polyester film having a matte surface on the surface of a reflective type photographic print.

3,697,278
PHOTOGRAPHIC MATERIAL COMPRISING A SILVER HALIDE ELEMENT WITH AN OVERLAYER OF GELATIN HARDENED WITH MUCOCHLORIC ACID

Albert Edward Harris and Ian Blundell, Ilford,, Essex, England, assignors to Ilford Limited, Ilford, England

No Drawing. Filed Apr. 10, 1969, Ser. No. 815,218

Int. Cl. G03c *1/76*

U.S. Cl. 96—67 **5 Claims**

This application describes photographic material suitable for use for the production of glazed prints, which material comprises in the unexposed and unprocessed state a support base having coated on at least one side a gelatino silver halide emulsion layer the said gelatin having been hardened by the presence of formaldehyde therein, the improvement that there is coated on this layer a gelatin supercoat layer which has been hardened by the presence of mucochloric acid therein.

3,697,279
POLYMER ENCAPSULATED SILVER HALIDE GRAINS AND PHOTOGRAPHIC MATERIALS EMPLOYING SAME

Howard G. Rogers, Weston, and Lloyd D. Taylor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 17, 1971, Ser. No. 115,985

Int. Cl. G03c *7/00, 1/40;* **B01j** *13/02*

U.S. Cl. 96—77 **13 Claims**

This invention is directed to microscopic capsules comprising a continuous synthetic polymeric layer surrounding a nucleus composed of photosensitive silver halide grains wherein the polymeric layer is of sufficient thickness to substantially overcome the attractive forces of said silver halide grains for adjacent silver halide grains. Thus, the present invention contemplates individual grains of photosensitive silver halide which are spatially separated from adjacent grains by means of a polymeric layer encasing the grains. The present invention is also directed to methods for providing such encapsulated products and to photographic products employing said capsules.

3,697,280
HEXAARYLBIIMIDAZOLE-SELECTED AROMATIC HYDROCARBON COMPOSITIONS

Peter S. Strilko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

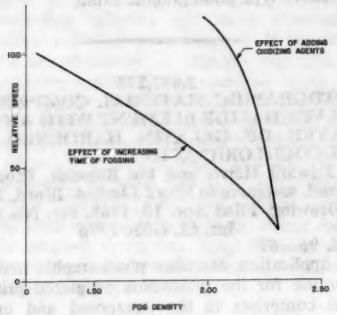
No Drawing. Filed May 22, 1969, Ser. No. 827,071

Int. Cl. G03c *1/72, 1/68, 5/24*

U.S. Cl. 96—90 **34 Claims**

Photoactivatable compositions comprising a hexaarylbiimidazole and a selected aromatic hydrocarbon having at least three fused benzenoid rings, and optionally, a leuco dye and/or a polymerizable monomer or inert components such as binders, solvents and the like. The compositions are photoactivated in the near ultraviolet or visible light wavelengths.

3,697,281
FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSIONS CONTAINING STRONG OXIDIZING AGENTS
Kirby Mitchell Milton, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 23, 1970, Ser. No. 100,997
Int. Cl. G03c *1/28, 5/24*
U.S. Cl. 96—108 14 Claims



Fogged, direct-positive silver halide emulsions are disclosed which have improved speed vs. maximum density characteristics. In one aspect, the improved fogged emulsions are made by reduction and noble-metal fogging the emulsion and then adding an oxidizing agent, such as potassium ferricyanide, to the emulsion prior to imagewise exposure.

3,697,282
SILVER HALIDE EMULSIONS WHICH ARE SPECTRALLY SENSITIZED AND WHICH CONTAIN COLOR COUPLERS
Oskar Riester, Leverkusen, and Marie Hase, Schildgen-Bergisch, Gladbach, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 15, 1969, Ser. No. 866,520
Claims priority, application Germany, Nov. 9, 1968, P 18 08 041.6
Int. Cl. G03c *1/10*
U.S. Cl. 96—139 1 Claim

Light sensitive photographic silver halide gelatine emulsion can be sensitized optically in the blue range of spectrum (range of inherent sensitivity) by quinoline monoazocyanines, wherein the second heterocyclic group is a quinoline benzothiazole or benzoselenazole group, and at least one of the ring nitrogen atoms carries an alkyl group containing an acid substituent.

3,697,283
METHOD FOR MAKING A FOOD PRODUCT IN PORTIONS OF CONTROLLED SIZE AND SHAPE
Alan B. Rogers, Palos Park, and Michael Sebring, Downers Grove, Ill., assignors to Armour and Company, Chicago, Ill.
No Drawing. Filed Sept. 8, 1969, Ser. No. 858,561
Int. Cl. A23l *1/32*
U.S. Cl. 99—1 13 Claims

An uncooked food product and method for preparing the same wherein gelatin is incorporated into a food product which is normally liquid before cooking. The food product with added gelatin is then stuffed into a casing and chilled. The molded product is sliced and cooked to provide a controlled portion of food product having natural flavor and texture.

3,697,284
PROTEIN-TRIAZINE RUMINANT FEED MATERIAL
Robert E. Miller, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 27, 1970, Ser. No. 84,474
Int. Cl. A23k *1/22*
U.S. Cl. 99—2 R 4 Claims

Improved protein feed material for ruminants which is resistant to digestive breakdown in the rumen but not in the abomasum and/or intestines which comprises the reaction product of a protein-containing feed material and a di- or trihalo-substituted triazine. Exemplary of such triazines is cyanuric chloride.

3,697,285
FISH PROTEIN SOLUBILIZATION USING ALKALINE BACTERIAL PROTEASE
William T. Faith, Jr., Warminster, Ronald B. Steigerwalt, Levittown, Ernest A. Robbins, Bristol, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Filed Oct. 10, 1969, Ser. No. 865,534
Int. Cl. A23j *1/04*
U.S. Cl. 99—18 16 Claims

The use of alkaline bacterial protease in enzymatic hydrolysis to effect solubilization and extraction of protein from fish, fish products or fish parts.

3,697,286
METHOD OF TREATING POWDER OR GRANULATE SUBSTANCES
Gustav Grun, Lissberg/Oberhessen, Germany
Continuation-in-part of abandoned application Ser. No. 93,011, Mar. 1, 1961, which is a division of application Ser. No. 474,134, July 22, 1965, U.S. Patent No. 3,469,562, which in turn is a continuation of abandoned application Ser. No. 842,742, Feb. 13, 1969. This application Dec. 16, 1970, Ser. No. 98,946
Int. Cl. A23c *9/00;* B44d *1/02*
U.S. Cl. 99—56 3 Claims

Substances in powder or granulate form are treated with substances in fluid form by injecting the powder or granulate substance downwardly in a reaction chamber into a spraying zone substantially removed from the upper end of the reaction chamber and near an outlet at the lowermost end of the reaction chamber while at the same time spraying the fluid substance into the spraying zone through a plurality of peripherally spaced openings in the side wall of the reaction chamber from nozzles located outside the chamber near the lowermost end of the chamber. During spraying, air is drawn through the outlet opening and upwardly through the chamber whereby the powder or granulate substance is caused to swirl in cloud formation while being treated with the fluid substance. The air is drawn upwardly at a rate to maintain the lighter and untreated substances in whirling motion and to allow the heavier treated substances to pass through the outlet opening by the action of gravity.

3,697,287
AMINO ACID FOOD COMPOSITION
Milton Winitz, Palo Alto, Calif., assignor to Morton-Norwich Products, Inc., Chicago, Ill.
No Drawing. Continuation-in-part of applications Ser. No. 510,778, Dec. 1, 1965, now abandoned, Ser. No. 550,204, May 16, 1966, and application Ser. No. 705,290, Feb. 14, 1968, now abandoned. This application Jan. 28, 1969, Ser. No. 794,790.
Int. Cl. A23l *1/00*
U.S. Cl. 99—1 31 claims

A composition palatable to the human species which contains all of the essential amino acids, essential minerals and carbohydrate. A complete palatable diet is shown

which contains in an aqueous emulsion the essential and non-essential amino acids, minerals, vitamins, carbohydrate and fat in balanced quantities to supply all of the nutritional needs for the human species and in a form to bypass normal digestive functions. The same diet in dry form is soluble as an aggregate in water.

3,697,288

VIBRATION ENERGY MILLING OF GROUND COFFEE SLURRIES

Joseph R. McSwiggin, Cincinnati, Ohio. assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,511
Int. Cl. A23f *1/08*
U.S. Cl. 99—71 **4 Claims**

Vibration energy milling of ground coffee slurries to provide a sediment-free additive for instant coffee.

3,697,289

AUTOMATIC POPCORN POPPING METHOD

Alan M. Day, Oakland, and Gordon D. Browning, Castro Valley, Calif., assignors to Compupop, Inc., San Leandro, Calif.

Filed Nov. 12, 1969, Ser. No. 875,759
Int. Cl. A23l *1/18*
U.S. Cl. 99—81 **5 Claims**

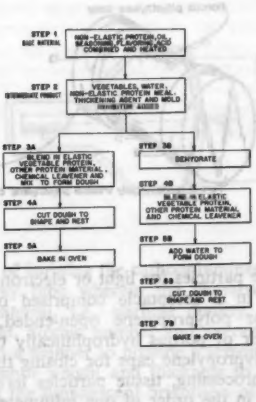
The method for automatically popping corn in heated seasoning oil. Raw corn is fed by an air conveyor to a hopper above the popping pot, and an air current is used for injecting a charge of corn and salt into the pot. Seasoning oil is metered into the pot by an adjustable valve providing precise volume measurement. The pot remains closed throughout a series of popping cycles. A vacuum is created in the pot during the popping cycle to prevent effluent from discharging into the display case and to draw it into the condenser.

3,697,290

HIGH PROTEIN EDIBLE PRODUCTS AND METHOD OF PREPARING SAME

Charles S. Lynn, 102—30 66th Road, Forest Hills, N.Y. 11375

Continuation-in-part of application Ser. No. 846,428, July 31, 1969. This application Nov. 25, 1969, Ser. No. 879,717
Int. Cl. A21d *13/04, 13/06*
U.S. Cl. 99—86 **18 Claims**


STEP 1
RAW MATERIAL
NON-ELASTIC PROTEIN OR REASONING FLAVORING AGENTS COMBINED AND HEATED
STEP 2
INTERMEDIATE PRODUCT
VEGETABLES, WATER, NON-ELASTIC PROTEIN MEAL, THICKENING AGENT AND MOLD INHIBITOR ADDED
STEP 3A
BLEND IN ELASTIC VEGETABLE PROTEIN, OTHER PROTEIN MATERIAL, CHEMICAL LEAVENER AND MIX TO FORM DOUGH
STEP 4A
CUT DOUGH TO SHAPE AND REST
STEP 5A
BAKE IN OVEN
STEP 3B
DEHYDRATE
STEP 4B
BLEND IN ELASTIC VEGETABLE PROTEIN, OTHER PROTEIN MATERIAL AND CHEMICAL LEAVENER
STEP 5B
ADD WATER TO FORM DOUGH
STEP 6B
CUT DOUGH TO SHAPE AND REST
STEP 7B
BAKE IN OVEN

High protein edible products and the method of preparing same are described. A baked, leavened product includes a non-elastic protein such as sesame or a combination of sesame and soy bean, an elastic type vegetable protein such as wheat gluten or wheat gluten in combination with edible gums, and flavoring and texturing agents including vegetables. Crackers and cereal are made using a much lower amount or eliminating the elastic type vegetable protein.

3,697,291

FURANONE MEAT FLAVOR COMPOSITIONS

Christiaan Herman Theodoor Tonsbeek, Orpington, Kent, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Sept. 18, 1968, Ser. No. 760,700
Claims priority, application Great Britain, Sept. 22, 1967, 43,364/67
Int. Cl. A23l *1/26*
U.S. Cl. 99—107 **11 Claims**

Improved meaty foodstuff in which the flavour of a meaty product or a meat simulating product is improved by the incorporation of 2,5-dimethyl- or 5-methyl-4-hydroxy-2,3-dihydrofuran-3-one or a precursor of these compounds.

3,697,292

USING SALVAGE CHEESE IN PREPARING PASTEURIZED PROCESS CHEESE

Robert M. Lauck, New City, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of application Ser. No. 812,916, Apr. 2, 1969, which is a continuation-in-part of application Ser. No. 553,633, May 31, 1966. This application Aug. 21, 1970, Ser. No. 65,823
Int. Cl. A23c *19/00, 19/12*
U.S. Cl. 99—115 **18 Claims**

Extrudable pasteurized process cheese utilizing large quantities of salvage cheese can be prepared by incorporating in the blend of the raw cheese, salvage cheese and usual process cheese emulsifiers, from about 0.00015% to about 2%, by weight, of a surface-active agent.

3,697,293

METHOD OF MAKING COTTAGE CHEESE

Kenneth R. Breidenstein, Winlock, Wash., assignor to Kraftco Corporation, New York, N.Y.

No Drawing. Filed Sept. 26, 1969, Ser. No. 861,484
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 **4 Claims**

The present invention relates to an improved dairy product and is particularly directed to cottage cheese. The invention involves a method for manufacturing a cottage cheese having an extended shelf life. The method of the invention relates to the heating of cottage cheese while being transported to a packaging station. During such transport the cheese curd is heated to a temperature of at least about 130° F.

3,697,294

PROCESS FOR PRODUCING A BAKERY FAT PRODUCT WITH IMPROVED ABILITY TO RETARD THE STALING OF BREAD

Ulo Riiner, Asarum, Sweden, assignor to AB Karlshamns Oljefabriker, Karlshamn, Sweden

No Drawing. Continuation-in-part of application Ser. No. 761,395, Sept. 16, 1968, now abandoned. This application Jan. 20, 1971, Ser. No. 108,156
Claims priority, application Sweden, Sept. 18, 1967, 12,810/67
Int. Cl. A23d *5/00*
U.S. Cl. 99—123 **3 Claims**

A process for producing a bakery fat emulsion with the ability of retarding the staling of bread, comprising

the steps of (1) preparing a dispersion of mainly 1-monoglyceryl esters of saturated fatty acids, containing 14 to 22 carbon atoms, in water and (2) emulsifying said dispersion into an edible fat component forming the continuous phase of the bakery fat emulsion.

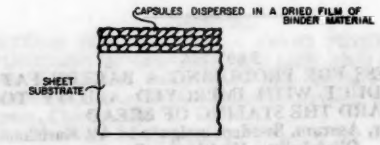
3,697,295
FLAVOURING SUBSTANCES
Godefridus Antonius Maria van den Ouweland and Henricus Gerardus Peer, Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.
No Drawing. Filed June 26, 1969, Ser. No. 836,968
Claims priority, application Great Britain, July 1, 1968, 31,378/68
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R **3 Claims**

A food flavour substance is prepared by reacting an heterocyclic ketone such as a furanone or a pyrone in the presence of water with hydrogen sulphide or a substance which is capable of giving rise to hydrogen sulphide.

3,697,296
ELECTROLESS GOLD PLATING BATH AND PROCESS
Harold Edward Bellis, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Mar. 9, 1971, Ser. No. 122,538
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **17 Claims**

A gold chemical plating bath is provided for depositing gold on a catalytic surface which is an aqueous solution having a pH of 1.5 to 5 and contains as essential ingredients a soluble gold compound and an alkali metal cyanoborohydride as the reducing agent. Optional, but preferred, ingredients are a chelating agent and an organic monovalent or divalent sulfur compound. Plating is preferably carried out at a temperature of 80 to 90° C.

3,697,297
GELATIN-GUM ARABIC CAPSULES CONTAINING CHOLESTERIC LIQUID CRYSTAL MATERIAL AND DISPERSIONS OF THE CAPSULES
Donald Churchill, James V. Cartmell, and Robert E. Miller, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Continuation of application Ser. No. 856,891, Sept. 2, 1969, now abandoned, which is a continuation of application Ser. No. 618,751, Feb. 27, 1967, now abandoned, which in turn is a continuation-in-part of application Ser. No. 558,354, June 17, 1966, now abandoned. This application Oct. 22, 1970, Ser. No. 83,181
Int. Cl. G01k *11/16*
U.S. Cl. 106—131 **4 Claims**



A temperature-responsive display device or composition, comprising mesomorphic ("liquid crystal") material(s) contained in minute capsules as the temperature-responsive component, is provided. The minute capsules, when placed in heat-conductive relation with a heat source together with an associated thermal gradient pattern to be displayed, exhibit an iridescence indicative of a certain characteristic temperature range, which temperature range varies according to the types and mixtures of mesomorphic materials affords physical and chemical protection from various kinds of degradation and allows their use in practical and efficient thermal-gradient display systems.

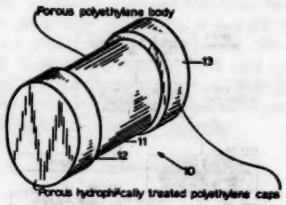
ERRATUM

For Class 106—291; see:
Patent No. 3,697,070

3,697,298
AIR DRYING POLY(VINYLIDENE FLUORIDE) COATINGS
Martin R. Hastings, Pittsburgh, and Glenn W. Luckock, Natrona Heights, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,505
Int. Cl. B23p *7/00;* **B32b** *27/30*
U.S. Cl. 117—2 R **13 Claims**

A method of applying continuous coatings comprising poly(vinylidene fluoride) without baking at high temperatures comprises applying on a substrate a thin layer of a composition comprising poly(vinylidene fluoride) and certain organic liquids, the liquids usable being those having a boiling point between about 125 and about 250° C. in which poly(vinylidene fluoride) forms a substantially clear solution in concentrations of at least 10 percent by weight. The method can be used to "touch-up" or repair baked poly(vinylidene fluoride) coatings, or for the application of continuous protective coatings on a substrate.

3,697,299
MICROSCOPY TISSUE RECEPTACLE METHOD
John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 27705
Original application Aug. 3, 1967, Ser. No. 658,252, now Patent No. 3,536,040. Divided and this application Sept. 23, 1969, Ser. No. 860,256
Int. Cl. A01n *1/00*
U.S. Cl. 117—3 **4 Claims**



Minute tissue particles for light or electron microscopy are processed in a receptacle comprised of a porous polyethylene or polypropylene open-ended, cylindrical body and a pair of porous hydrophilically treated polyethylene or polypropylene caps for closing the respective ends. During processing, tissue particles having at least one dimension in the order of one millimeter are stored in the receptacle after which the receptacle is submerged in various organic fixative and processing liquids which

gain access to the particles by passing through the porous cylindrical body and caps and in various aqueous fixative and processing solutions which gain access to the tissue by passing through the porous hydrophilically treated caps.

3,697,300

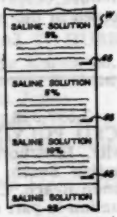
CONTINUOUS STRIP OF LABEL WEB

George W. von Hofe, Millington, N.J., assignor to New Jersey Machine Corporation, Hoboken, N.J.

Continuation-in-part of application Ser. No. 523,756, Jan. 28, 1966, now Patent No. 3,536,550. This application July 29, 1970, Ser. No. 59,151

Int. Cl. H01f *10/00*

U.S. Cl. 117—15 10 Claims



A continuous web having a plurality of items such as labels printed successively along the web and including a first series of control elements each of which is located in a given position on the web relative to one of the items, and a second series of control elements located at different positions on the web relative to such items.

3,697,301

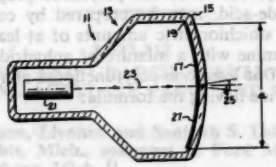
PROCESS OF FORMING CATHODE RAY TUBE SCREENS TO UTILIZE THE LUMINOUS EFFICIENCY OF THE PHOSPHOR MATERIAL

Robert L. Donofrio, Syracuse, and Charles H. Rehkopf, Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated

Continuation-in-part of application Ser. No. 846,348, July 31, 1969. This application Apr. 5, 1971, Ser. No. 130,962

Int. Cl. H01j *31/20*

U.S. Cl. 117—33.5 C 11 Claims



A process of forming the cathodoluminescent screen of a cathode ray tube wherein the characteristics of the phosphor material, i.e., particle density, bulk density, atomic weight, atomic number and average particle size are related in a manner to provide a screen having a prescribed phosphor weight and thickness to effect efficient utilization of the luminescent brightness of the respective phosphor material when excited by subsequent electron beam impingement.

3,697,302

DRUM-PHOTOSENSITIVE MEMBER AND METHOD FOR MANUFACTURING THEREOF

Takashi Ihara, Kawasaki-shi, Takehiko Matsuo, Tokyo, and Katsunobu Ohhara, Kawasaki-shi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 2, 1969, Ser. No. 854,714

Claims priority, application Japan, Sept. 6, 1968, 43/64,205

Int. Cl. B05c *11/04*; B44d *1/02*; G03c *1/74*

U.S. Cl. 117—34 13 Claims

A photosensitive member having a smooth and uniform surface provided by coating photosensitive material on a drum in uniform thickness. The principal novel method comprises rotating a cylinder on its horizontal axis, placing a knife edge of a blade along a cylinder generating line outside of the cylinder surface, maintaining a predetermined gap between the knife edge and the cylinder surface, facing the knife edge to the surface, supplying a wet photosensitive material to the V-shaped section formed by the upper surface of the blade and the cylinder surface, thereby coating the cylinder surface through said gap and then tilting the blade to bring the knife edge to a higher position than the opposite edge of the blade so as to cause excessive wet photosensitive material to flow from the drum over the surface of the blade to leave a uniform coating of photosensitive material on the drum.

3,697,303

PROCESS FOR COATING THE SURFACE OF A MATERIAL

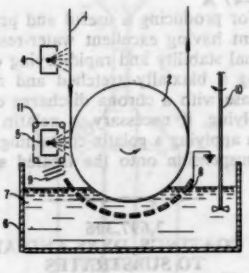
Walter Busch, Wiesbaden-Biebrich, Heinz Kramer, Wiesbaden-Bierstadt, Erwin Lind, Auringen uber Wiesbaden, and Dieter Messner, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Sept. 29, 1969, Ser. No. 861,794

Claims priority, application Germany, July 31, 1969, P 17 90 220.4

Int. Cl. B44d *1/06*

U.S. Cl. 117—37 LE 13 Claims



This invention relates to a process for coating the surface of a material with an electrically conductive, semiconductive, or non-conductive substance, in which process either a highly insulating base material or base material

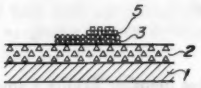
with a highly insulating backing is completely discharged, the surface of the material is then electrically charged by means of a direct-current corona discharge, and coated within a field of uniform field strength distribution with the substance dispersed in a dielectric liquid, while the material is in close contact with an electrically conductive support.

3,697,304

METHOD FOR RETOUCHING AN ELECTROPHOTOGRAPHIC OFFSET MASTER PLATE

Koji Uchida and Sadao Kuriu, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 10, 1970, Ser. No. 96,726
Claims priority, application Japan, Dec. 12, 1969, 44/99,420
Int. Cl. B41n *5/00;* B41o *3/08*
U.S. Cl. 117—37 R 6 Claims



An electrophotographic offset master plate can be retouched by applying a solution to areas of the plate which are to be deleted from printed products, prior to rendering non-imaged portions ink-repellent. The solution contains metal compound which reacts with rendering solution (which renders the non-imaged portions ink-repellent and water-receptive) comprising water soluble metal salt of hexacyano metallic acid and/or ammoniumphosphate to produce hydrophilic water insoluble precipitates. In spite of uniform wiping of the surface with rendering solution, the imaged portions are still oleophilic while non-imaged portions become hydrophilic. This is because that near the non-imaged surface there exist materials which react with rendering solution to form hydrophilic and water insoluble precipitates e.g. $K_2Zn_3[Fe(CN)_6]_2$, $ZnNH_4PO_4$ etc., while near the imaged surface such materials don't exist.

3,697,305

METHOD FOR PRODUCING A PHOTOGRAPHIC ELEMENT

Sumitaka Tatsuta, Wataru Ueno, Tatsuya Tajima, and Mutsuo Akao, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 8, 1970, Ser. No. 96,207
Claims priority, application Japan, Dec. 8, 1969, 44/98,485; Mar. 11, 1970, 45/20,695
Int. Cl. G03c *1/78*
U.S. Cl. 117—47 A 6 Claims

A method for producing a useful and practical photographic element having excellent water-resisting properties, dimensional stability and rapid-drying qualities comprising treating a biaxially-stretched and roughed polystyrene film base with a corona discharge or electron irradiation, applying, if necessary, a gelatin layer to said base, and then applying a gelatin-containing photographic emulsion or suspension onto the treated surface of the support.

3,697,306

BONDING COATINGS, DYES AND ADHESIVES TO SUBSTRATES

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,491
Int. Cl. B44d *1/092*
U.C. Cl. 117—47 A 9 Claims

Organic coating compositions, e.g., siccative coatings such as paints, varnishes, enamels, lacquers, inks and the like, dyes, adhesives, and the like, can be applied to substrates which have been subjected to elemental phosphorus, partially oxidized and thereafter washed with water.

3,697,307

STRONG DURABLE PRESS CELLULOSIC FABRICS

Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 18, 1970, Ser. No. 99,513
Int. Cl. B44d *1/092;* D06m *15/52*
U.S. Cl. 117—56 7 Claims

Tensile properties and abrasion resistance of durable press cellulosic fabrics are improved by treatment with cyclic acetals obtained by reaction of glyoxal with ethylene glycol. The cyclic glyoxal acetals usually are applied to the fabric as a mixture of two isomeric forms, and the treated fabric is cured in the presence of the durable press formulation.

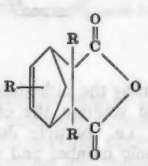
3,697,308

BORON REINFORCED POLYIMIDE COMPOSITES

Hyman R. Lubowitz, Hawthorne, and Robert W. Vaughan, Manhattan Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Continuation-in-part of application Ser. No. 875,523, Nov. 10, 1969. This application May 25, 1970, Ser. No. 40,405
The portion of the term of the patent subsequent to Feb. 23, 1988, has been disclaimed
Int. Cl. B32b *15/08*
U.S. Cl. 117—65.2 20 Claims

This invention is directed to a process for preparing reinforced resin laminates and the products obtained therefrom characterized as having improved thermal stability and low-void content. More specifically this invention is directed to a process of preparing reinforced polyimide laminates or plastic composites which comprises impregnating a substantially fibrous material, i.e., boron filaments with an effective amount of an organic solution of a polyamide-acid precursor. The boron filaments impregnated with the precursor, i.e., the polyamide-acid, may be heated to temperatures ranging up to about 125° C. to remove a substantial part of the solvent and thereby obtain an intermediate which may be characterized as having tack and drape. Subsequently, the polyamide-acid may be imidized, in situ, to the imide prepolymer and then cured or alternatively cured directly by the application of heat with temperatures ranging from about 125° C. to 350° C. and at pressures ranging up to about 1200 p.s.i. Under these conditions, the polyamide-acid will be cured, in situ, to form a reinforced thermosetting resin laminate or composite. The precursor of the polyimide prepolymer, i.e., the polyamide-acid, may be prepared by coreacting approximately stoichiometric amounts of at least one polyfunctional amine with a mixture of anhydrides consisting essentially of at least one polyfunctional anhydride and a monoanhydride having the formula:



wherein R is selected from the group consisting of hydrogen and lower alkyl radicals having 1 to 5 carbon atoms per molecule and combinations thereof.

3,697,309

ADHESION OF FLUOROPOLYMER TOPCOAT

Ervin R. Werner, Jr., Levittown, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 45,945, June 12, 1970, which is a division of abandoned application Ser. No. 778,828, Nov. 25, 1968. This application Dec. 22, 1970, Ser. No. 100,764

Int. Cl. B44d *1/36*; B32b *15/08*

U.S. Cl. 117—72 14 Claims

A method for improving the adhesion of a fluorocarbon polymer coating to its substrate with a composition of 10–75% of lithium polysilicate, 25–90% of a fluorocarbon polymer and a liquid carrier.

3,697,310

METHOD OF BONDING POLYESTER SYNTHETIC FIBROUS MATERIAL TO RUBBER COMPOUND

Osamu Kurihara, Naoya Kuramoto, Masaya Kamiyoshi, and Takeshi Yamaguchi, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,274

Claims priority, application Japan, Jan. 29, 1970, 45/7,840

Int. Cl. C08d *13/16*; B32b *27/36*

U.S. Cl. 117—76 T 8 Claims

A polyester fibrous material is bonded to rubber with superior bond strength by applying to the polyester material an aqueous adhesive dispersion comprising (A) a water-insoluble phenol/aldehyde resin having a melting point of not more than 160° C. or a viscosity of at least 50 centipoises obtained by condensing one mol of phenol or its derivative, 0.2 to 1.0 mol of formaldehyde and 0.05 to 0.5 mol of an alkyl or arkenyl aldehyde such as n-butyraldehyde and (B) a rubber latex, and bonding the polyester material to rubber by heating and vulcanization.

3,697,311

COATED ETHYLENE-POLAR MONOMER COPOLYMER SUBSTRATE

John F. Aleckner, Jr., Buffalo Grove, Ill., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Ser. No. 782,719, Dec. 10, 1968. Divided and this application Mar. 31, 1971, Ser. No. 129,941

Int. Cl. B32b *27/08*, *27/32*

U.S. Cl. 117—72 6 Claims

The adhesion of coatings to ethylene-polar monomer copolymer substrates is enhanced by the use, as an adhesion promoter, of vinyl acetate polymer in the form of a primer coat.

3,697,312

EPOXY RESIN AND GRADED ACRYLIC RUBBER-URETHANE-ACRYLATE PAINT AND PAINTING PROCESS

Olin B. Johnson, Livonia, and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,495

Int. Cl. C08g *45/05*, *41/04*; C08f *15/00*

U.S. Cl. 117—93.31 10 Claims

A radiation-curable paint binder dispersion comprises vinyl monomers, an alpha-beta olefinically unsaturated epoxy resin having molecular weight in excess of about 370, and an addition prouct of a hydroxy-functional graded rubber particle, a diisocyanate and a hydroxyalkyl acrylate. The dispersion is applied to substrates and cured thereon by exposure to ionizing radiation, e.g., an electron beam.

3,697,313

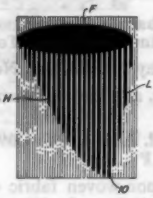
METHOD OF SPRAYING CLOSED END CANS

William C. Stumphauzer, Sheffield Lake, Edwin F. Hogstrom, North Olmsted, Eric T. Nord, Oberlin, Richard E. Schneider, Elyria, and Alvin A. Rood, Westlake, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Feb. 24, 1970, Ser. No. 13,598

Int. Cl. B44d *1/08*

U.S. Cl. 117—96 8 Claims



Method and means for coating the interior cylindrical surface of objects such as metal cans for food, beverages and other substances which need protection against injurious reaction with or pollution from contact with the material of the can. Rapid airless spray coating of such surfaces, while the surfaces are revolving at high speed, from a stationary spray nozzle external of the can, by projecting a spray having an asymmetrical pattern into the single open end of a can having one closed end, with the pattern of flow emerging from the nozzle being matched to the internal surface configuration to apply a uniform coating. Also disclosed are spray nozzles having their outlet orifices designed to provide desirable spray patterns for use in this method of spraying, as well as methods for making and shaping the outlet orifices.

3,697,314

METHOD FOR TREATING A YARN WITH FOAM

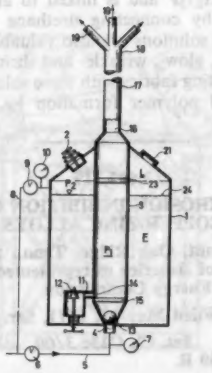
Vilem Stritzko, Zofingen, Switzerland, assignor to Bleiche AG, Zofingen, Switzerland

Filed July 29, 1970, Ser. No. 59,131

Claims priority, application Switzerland, July 30, 1969, 11,579/69

Int. Cl. B44d *1/02*

U.S. Cl. 117—120 6 Claims



A foam is continuously made in a hollow body by pressing a gaseous medium into a liquid. The foam is made

finer by passage through at least one porous member, and then continuously applied to a yarn moving across an outlet for the foam and through a foam agglomeration forming at the outlet. The foam-forming liquid is a yarn-finishing agent, such as a smoothing polish, a stiffening agent, or a dye.

3,697,315

SELF-ADHESIVE AND REMOVABLE NON-WOVEN FABRIC AND PROCESS FOR PRODUCING THE SAME

Keiji Mine, Matsubarashi, Japan, assignor to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 7, 1970, Ser. No. 35,448

Claims priority, application Japan, July 21, 1969, 44/58,111

Int. Cl. A61l *15/00;* **C09j** *7/04*

U.S. Cl. 117—122 P **9 Claims**

A self-adhesive non-woven fabric comprising a rough surfaced fiber sheet of staple fibers, wherein the staple fibers on both sides of the sheet are coated with an adhesive mixture of a natural rubber latex, a synthetic resin latex, and an antioxidant, wherein said latex mixture is characterized by being generally non-adhesive toward said fibers.

3,697,316

FIRE-RESISTANT ORGANIC PRODUCTS AND METHOD FOR PRODUCTION

John V. Beninate, Gretna, Donald J. Daigle, New Orleans, and George L. Drake, Jr., Wilson A. Reeves, and Darrell J. Donaldson, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 7, 1971, Ser. No. 141,352

Int. Cl. C09d *1/00*

U.S. Cl. 117—136 **12 Claims**

Methylol phosphines, methylol phosphines in combination with amine or amido compounds or water soluble adducts of these methylol phosphines and amides or amines when mixed and reacted with mono, di or polyisocyanates wherein the isocyanate groups are attached to carbon atoms are particularly valuable for the preparation of thermosetting flame resistant polymers. The polymers which are produced are crosslinked phosphorus and nitrogen containing polymers in which the reoccurring structure units each contain a phosphorus atom, that is a component of a radical of the group tris(methylene)-phosphine $(—CH_2)_3P$ and is linked to at least one isocyanate radical by connecting urethane structure. The polymer forming solutions are also valuable for the preparation of flame-, glow-, wrinkle- and shrink-resistant textiles by impregnating fabrics with these solutions and causing reaction and polymer formation by application of heat.

3,697,317

CORROSION INHIBITION OF COPPER-ZINC ALLOYS

Charles R. Schmitt, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed May 19, 1971, Ser. No. 145,034

Int. Cl. C23c *3/00*

U.S. Cl. 117—130 R **3 Claims**

The corrosion of copper-zinc alloys in water due to the dissolution of zinc is inhibited by passivating exposed surfaces of the alloy with magnesium.

3,697,318

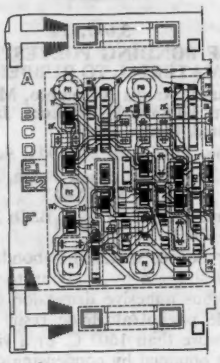
MONOLITHIC INTEGRATED STRUCTURE INCLUDING FABRICATION THEREOF

Irving Feinberg, Poughkeepsie, and Jack L. Langdon and Carl L. Sitler, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Original application May 23, 1967, Ser. No. 640,610, now Patent No. 3,539,876, dated Nov. 10, 1970. Divided and this application Dec. 12, 1969, Ser. No. 889,807

Int. Cl. B44d *1/18;* **H01b** *13/00;* **H05k** *3/00*

U.S. Cl. 117—212 **5 Claims**



This invention relates generally to monolithic integrated structures including the fabrication thereof and, more particularly, to a monolithic integrated structure that is used to provide a multiplicity of various circuit interconnections so as to permit more than one circuit to be made for each structure. Many logic type integrated structures can be fabricated from a single master slice configuration which contains a number of components in a pattern favorable to the formation of any selected logic circuit from a class of many such circuits. Additionally, fabrication techniques are described for facilitating formation of the integrated chip which include mask alignment techniques, chip testing techniques, chip identification, process step identification, engineering change number identification, etc.

3,697,319

METHOD OF METALLIZING AN ELECTRICALLY INSULATING SURFACE

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation

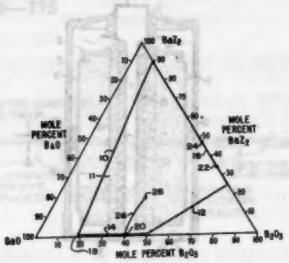
No Drawing. Filed Dec. 9, 1970, Ser. No. 96,661

Int. Cl. B41m *3/08;* **B44d** *1/14*

U.S. Cl. 117—212 **6 Claims**

A layer of a resinous adhesive having a metal formate salt dispersed therein is applied to the insulating surface. The layer is then heated to decompose the metal formate salt and to produce decomposition products of the metal of the salt and gases, which form micropores in the layer at the surface. The surface of the layer is then electrolessly plated with a metal for which the metal of the formate salt is a catalyst.

3,697,320
METHOD AND FLUX FOR GROWING SINGLE CRYSTALS OF GARNET OR ORTHO FERRITES
Ronald Hiskes, Palo-Alato, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 11, 1971, Ser. No. 105,405
Int. Cl. B01j *17/20*
U.S. Cl. 117—234 9 Claims



A flux consisting of BaO, B_2O_3 and a barium halide such as BaF_2, $BaCl_2$, $BaBr_2$ or BaI_2 is used for the solution growth of synthetic garnets and orthoferrites when appropriate amounts of the proper nutrients are dissolved in this flux and allowed to precipitate out as single crystals. This occurs either by slowly cooling an initially unsaturated solution, or by continuously dissolving nutrient in a hotter region of the solution, transporting it down a temperature gradient and allowing it to precipitate out in the cooler region of the solution. The precipitation may occur on a seed crystal of the same material placed in the cool region of the solution (a bulk growth process), or it may occur homoepitaxially on a thin substrate of the same material or heteroepitaxially on a substrate of different composition.

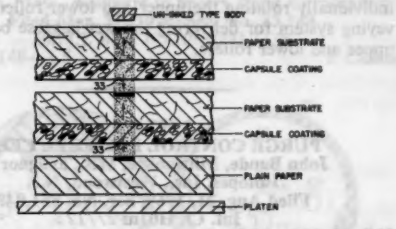
3,697,321
THERMIONIC CATHODE AND METHOD OF MANUFACTURING THE SAME
Georg Eckert, Munich, and Günther Ciriack, Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
No Drawing. Filed June 20, 1968, Ser. No. 738,402
Claims priority, application Germany, June 21, 1967, P 16 14 541.8
Int. Cl. B44d *1/18;* H01j *1/14*
U.S. Cl. 117—217 11 Claims

A thorium film thermionic cathode in electron discharge devices and method of manufacturing the same wherein a high melting metal carrier, such as tungsten or tungsten alloy, contaminated with thorium oxide is provided with a coating containing an inner layer of tungsten carbide and an outer layer of a high melting metal having migrational properties and functioning as an emission base for thorium, such as osmium or rhenium.

3,697,322
MAGNESIUM OXIDE COATINGS
Leonard S. Lee, Daly City, and Yoshio Uyeda and Leo F. Heneghan, San Mateo, Calif., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 40,479, May 22, 1970. This application Aug. 17, 1970, Ser. No. 64,644
Int. Cl. H01f *1/04*
U.S. Cl. 117—234 5 Claims

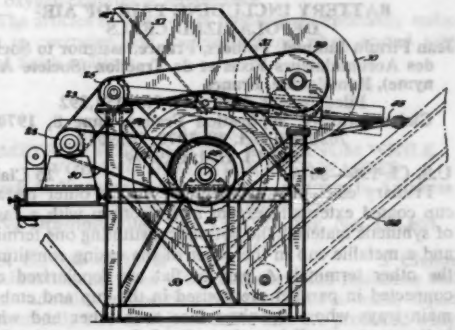
Lithium additives in magnesium oxide/magnesium hydroxide coatings for silicon steel and the material coated by such process.

3,697,323
PRESSURE-SENSITIVE RECORD MATERIAL
George T. Brown, Jr., and Donald B. Clark, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Jan. 6, 1971, Ser. No. 104,378
Int. Cl. B41m *5/10;* C04b *35/00*
U.S. Cl. 117—234 37 Claims



Record material coating formulations and record material sheets coated with thick, pad-like, pressure-responsive, compressible and collapsible coatings comprising minute bits of material held firmly together on a surface of a record material substrate with binder material. Said bits of material are randomly mixed in loose-packed interspersion with each other throughout the breadth and depth of the coatings and comprise minute marking-liquid droplets which are held individually confined by organic, polymeric, film material and optionally comprise filler material particles occupying part of the space between the loose-packed marking-liquid droplets. Because they are loosely packed, the coatings are crushable in two stages or degrees in that they yield to weak pressures, such as those associated with careless handling, by being compressed and packed to a first stage without release of marking liquid, and collapse under greater applied pressure associated with printing or writing to a second compressed state to yield marking liquid in a pattern conforming to the printing or marking pressure pattern applied.

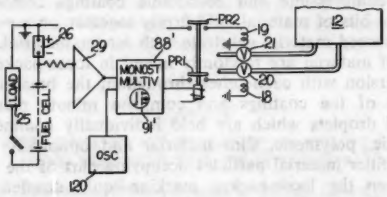
3,697,324
APPARATUS FOR REMOVING LIQUID FROM FIBROUS MATERIALS
Clarence R. Steele, Frank B. Price, and John M. Marshall, Denver, Colo., assignors to CF&I Engineers, Inc., Denver, Colo.
Filed Oct. 2, 1969, Ser. No. 863,160
Int. Cl. B30b *3/04, 9/20;* C13d *1/02*
U.S. Cl. 127—2 13 Claims



An apparatus for removing liquid from a mixture of liquid and fibrous material is provided for use in accomplishing the first stage removal of water from a sugar

cane processing by-product known as bagasse. The apparatus is generally constructed of a lower perforated cylindrical roller which is provided with a plurality of openings adapted to receive water from the bagasse, an upper cylindrical roller which is offset from a vertical orientation with the lower roller by an offset angle of 30° to 60° from vertical, a system for removing water collected from the wet bagasse, motor drive systems for individually rotating the upper and lower rollers and conveying system for delivering the wet bagasse between the upper and lower rollers.

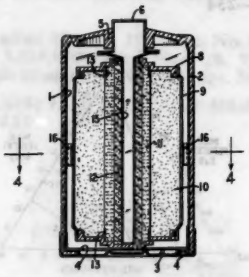
3,697,325
PURGE CONTROL FOR FUEL CELL
John Baude, Milwaukee, Wis., assignor to Isotopes, Inc., Westwood, N.J.
Filed Aug. 21, 1969, Ser. No. 851,948
Int. Cl. H01m *27/12*
U.S. Cl. 136—86 B **19 Claims**



Impurities accumulated within a fuel cell from the reactants are flushed from the cell by periodic operation of valves which permit reactant flow at a sufficiently high rate to purge, i.e., clean the cell plates. Operation of the valves is governed by the ampere-hour output of the fuel cell. The voltage developed by the flow of fuel cell load current through a shunt controls the frequency of output pulses from a voltage-to-frequency converter, and the pulses are supplied to frequency dividing means including a binary type counter which controls the purge valves. The submultiple of the input pulse frequency to the counter is selectively variable to adjust the number of ampere-hours between purges, and the frequency dividing means includes a monostable multivibrator whose period is selectively variable to adjust the duration of each purge.

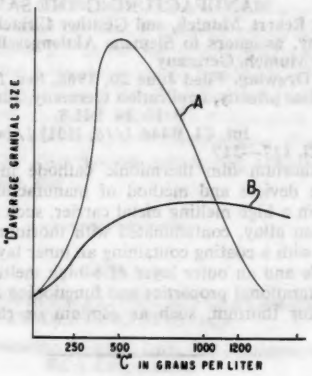
3,697,326
BATTERY INCLUDING PAIR OF AIR-DEPOLARIZED CELLS
Jean Firmin Jammet, Poitiers, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France
Filed June 9, 1971, Ser. No. 151,292
Claims priority, application France, June 8, 1970, 7020985; Oct. 29, 1970, 7039012
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 A **25 Claims**

Primary electric battery comprising an outer metallic cup coated externally except at its bottom with a casing of synthetic material, the bottom constituting one terminal and a metallic cap in the cover of the casing constituting the other terminal. A pair of flat air depolarized cells connected in parallel are housed in the cup and embody main trays whose openings face each other and whose bottoms are parallel to the axis of the cup, each of the trays containing a negative electrode, an immobilized electrolyte preferably carried by a separator, and a positive electrode arranged in layers in each tray. The trays are separated by a space in communication with the exterior of the battery during its operation. The space is positioned preferably between the positive electrodes of the facing trays. The positive and negative electrodes of



both trays are parallelly connected electrically respectively to the metallic cap and the metallic cup. Provision is made for expansion of the negative electrodes when the batteries are in use.

3,697,327
ELECTROLYTE FOR DRY BATTERIES AND DRY CELL BATTERIES USING SUCH ELECTROLYTE
Pierre Michel Rene Croissant, Smarves, Jean-Claude Armbruster, Poitiers, and Andree Chaumeau, Saint-Julien-l'Ars, France, assignors to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France
Filed Apr. 15, 1970, Ser. No. 28,787
Claims priority, application France, Apr. 22, 1969, 6912686; Jan. 29, 1970, 7003141
Int. Cl. H01m *9/04*
U.S. Cl. 136—157 **10 Claims**



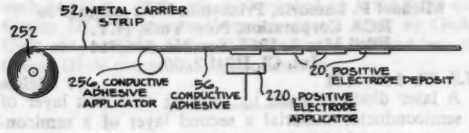
Electrolyte for dry cells and batteries of the Leclanché type embodying a salt solution of zinc chloride free from ammonium chloride and an organic gelling agent of reticulated granules of selected starches, the reticulated structure of the granules preventing liquefaction of the electrolyte and preventing leakage of said electrolyte, dry cells and batteries including such electrolyte and method of manufacturing dry cells and batteries embodying such electrolyte to improve operation and minimize production cost, as well as prevent leakage.

3,697,328

DUPLEX ELECTRODE CONSTRUCTION USING CONTINUOUS METAL CARRIER STRIP COATED ON ONE SIDE WITH CONDUCTIVE ADHESIVE

John M. Bilhorn, Edgerton, Wis., assignor to ESB Incorporated

Filed Dec. 21, 1970, Ser. No. 100,267
Int. Cl. H01m 1/00
U.S. Cl. 136—175 4 Claims



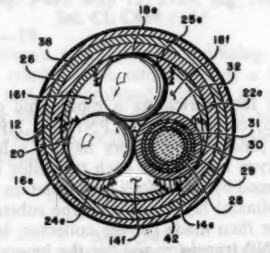
A duplex electrode is constructed by first coating one side of a continuous metal carrier strip with electrically conductive adhesive material and then placing intermittent deposits of positive electrode along the coated side of the carrier strip. The duplex electrode is then assembled into a multicell battery where a segment of the metal carrier strip functions as the negative electrode of one cell, the deposit of positive electrode functions as the positive electrode in an adjacent cell, and the deposit of conductive adhesive functions as the intercell connector. The assembly preferably occurs while the duplex electrodes are structurally and electrically connected by the continuous carrier strip after which the carrier strip is subsequently cut between duplex electrodes to obtain structurally and electrically unconnected batteries. Alternatively, the electrodes are assembled into multicell batteries. Preferably, the metal carrier strip is zinc and the positive electrodes comprise manganese dioxide.

3,697,329

RADIOISOTOPE HEAT SOURCE SYSTEM

James F. Bunker, Malvern, James E. Poland and Emerson H. Sayell, Phoenixville, and George V. Schmidt, Norristown, Pa., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed June 4, 1971, Ser. No. 149,967
Int. Cl. G21h 1/10
U.S. Cl. 136—202 12 Claims



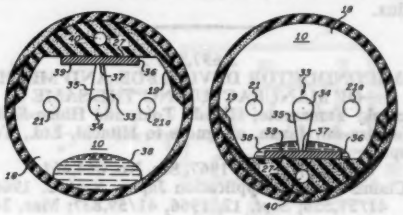
A radioisotope heat source system which comprises a plurality of radioisotopic heat source devices arranged helically or in offset levels about and within an elongated supporting member. The supporting member provides protection and effective heat utilization thereof. Additional protective and heat transfer layers may be provided about the heat source devices and supporting member along with means for utilizing heat produced thereby.

3,697,330

LIQUID EPITAXY METHOD AND APPARATUS

Henry T. Minden, West Concord, and John A. Donahue, Sudbury, Mass., assignors to Sperry Rand Corporation

Filed Mar. 27, 1970, Ser. No. 23,148
Int. Cl. B01j 17/20; H01l 7/38
U.S. Cl. 148—1.5 5 Claims



A method and apparatus for practicing liquid-phase epitaxial purification of semiconductor materials and for the preparation of semiconductor films or junction semiconductor devices employs a novel closed cylindrical graphite crucible element. The molten material to be deposited on a substrate is brought into contact with the substrate by simple rotation of the crucible about an axis of symmetry.

3,697,331

PROCESS FOR THE AFTER-TREATMENT OF PHOSPHATE-COATINGS

Malcolm H. Shatz, Williamsville, N.Y., and Edward Leon, Parkersburg, W. Va., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,060
Int. Cl. C23f 11/00
U.S. Cl. 148—6.15 R 14 Claims

A process for the after-treatment of phosphatized metal articles, which process comprises treating the phosphatized surface of the metal article with aqueous solution containing an alkali metal salt of a novolac phenol-formaldehyde resin having a molecular weight of from about 300 to about 5,000, and heating the treated article at a temperature of at least about 190° C. in the presence of an oxygen-containing atmosphere.

The articles so treated are rendered exceptionally resistant to corrosion and to undercutting when coated with final finish coatings.

3,697,332

METHOD FOR COATING ALUMINUM WHILE AVOIDING OBJECTIONABLE WASTES

Mark A. Kuehner, North Hills, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

No Drawing. Filed Feb. 11, 1971, Ser. No. 114,667
Int. Cl. C23f 7/14
U.S. Cl. 148—6.15 R 5 Claims

Aluminum surfaces with good corrosion resistance and paint adhesion properties, together with a waste liquid substantially free of objectionable ions are produced when the aluminum is treated with a solution of phosphate, molybdate, and fluoride, and when the waste stream is rendered basic with lime (pH 11) and then neutralized with sulphuric acid (pH 7).

3,697,333

WELDING PASTE FOR RESISTANCE WELDING COPPER PARTS

Albert Hoeffleur, Alte Landstrasse 29, Kusnacht, Switzerland

No Drawing. Original application May 2, 1968, Ser. No. 730,919, now Patent No. 3,602,682. Divided and this application Oct. 21, 1970, Ser. No. 90,229
Int. Cl. B23k 35/34, 11/18
U.S. Cl. 148—24 1 Claim

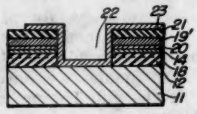
A welding paste for joing copper parts by resistance welding by coating such parts to be joined at the points prior to welding with the paste containing a mixture of powdered silver solder or powdered silver and a soldering flux.

3,697,334

SEMICONDUCTOR DEVICE FOR AND METHOD OF MANUFACTURING THE SAME

Masayuki Yamamoto, Hisashi Toki, and Hideo Shibuya, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1967, Ser. No. 664,461
Claims priority, application Japan, Sept. 2, 1966, 41/57,558; Sept. 12, 1966, 41/59,837; Mar. 24, 1967, 42/17,991
Int. Cl. H01l 3/14
U.S. Cl. 148—33.3 41 Claims



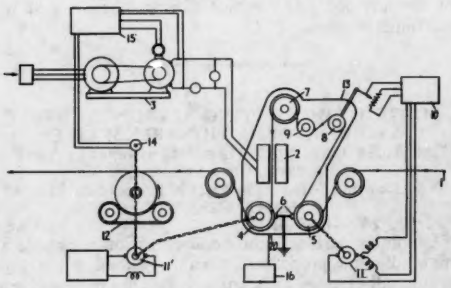
A semiconductor device comprising a silicon substrate, an insulating film containing silicon oxide and phosphorus oxide which is formed on the surface of said silicon substrate, and a protective coating containing aluminum oxide which is formed on the insulating film.

3,697,335

METHOD FOR ANNEALING FLEXIBLE METALLIC MATERIAL

John Kyriakis, Greenford, and Walter Roland Tole, High Wycombe, England, assignors to Beta Instrument Company Limited, High Wycombe, England

Filed Nov. 7, 1969, Ser. No. 874,896
Claims priority, application Great Britain, Nov. 11, 1968, 53,364/68
Int. Cl. C21d 1/26, 1/42
U.S. Cl. 148—154 4 Claims



A method and apparatus for annealing flexible metallic material in which the material is passed by means of an electric motor through an annealing device. A length of the material is formed into a loop and short circuited to form a shorted single turn secondary of an induction coil so that induced current in the material heats and anneals it. The tension in the material is controlled by a device which detects changes in tension and which is coupled to two identical control circuits controlling the speed of the motor.

3,697,336

METHOD OF MAKING SEMICONDUCTOR DEVICES

Michael F. Lamorte, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1966, Ser. No. 546,814
Int. Cl. H01l 7/00
U.S. Cl. 148—171 7 Claims

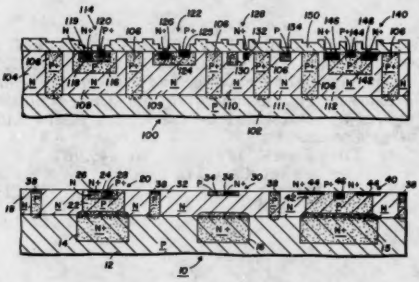
A laser diode is made by forming on a first layer of a semiconductor material a second layer of a semiconductor material. Masking strips of silicon dioxide are provided in spaced relation on the surface of the second layer leaving portions of the surface exposed. The exposed portions of the second layer are dissolved to the depth of the junction between the first and second layers using a molten mixture of Ga and GaAs. By solution regrown, a third material is deposited in place of the portions dissolved.

3,697,337

PROCESS FOR FABRICATING A MONOLITHIC CIRCUIT WITH HIGH Q CAPACITOR

Robert A. Stehlin, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original application June 30, 1967, Ser. No. 650,496, now Patent No. 3,474,309, dated Oct. 21, 1969. Divided and this application Feb. 5, 1969, Ser. No. 810,436
Int. Cl. H01l 7/36, 19/00
U.S. Cl. 148—175 6 Claims



A process for fabricating a monolithic circuit having both matched complementary PNP and NPN transistors and double junction capacitors having a high Q value. Insolated n-type regions for each transistor and the capacitor are formed by diffusing p-type isolation rings through an n-type epitaxial layer into a p-type substrate. Separate diffusions are then made for the collector, base and emitter of the PNP transistor and for the base and emitter of the NPN transistor. The capacitor is formed by the same diffusions that form the collector region of the PNP transistor and the diffusion that forms the emitter of the NPN transistor. The collector diffusion for the PNP transistor is relatively deep and the emitter diffusion for the NPN transistor is relatively shallow, thus providing a low resistivity charging path through the p-type region to the opposed junctions forming the capacitor.

3,697,338
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES
Shojiro Asai, Hachioji, Motohisa Hirao, Tokyo, and Eiichi Maruyama, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 17, 1971, Ser. No. 116,133
Claims priority, application Japan, Feb. 18, 1970, 45/13,484
Int. Cl. H01l 7/44
U.S. Cl. 148—188 5 Claims

A method of manufacturing semiconductor devices by solid-solid diffusion wherein a Group III–VI compound such as Ga_2S_3, Al_2S_3, etc. is deposited on a substrate of a Group III–V compound semiconductor such as GaAS, GaP, etc., and the Group VI element is diffused into the Group III–V compound semiconductor.

3,697,339
SOLID PROPELLANT CHARGE FOR COMBINED ROCKET-RAM-JET ENGINES AND PROCESS FOR MAKING THE SAME
Paula Sarten, Munich, and Winfried Mair, Riemerling, Germany, assignors to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, near Munich, Germany
No Drawing. Filed Jan. 16, 1969, Ser. No. 791,802
Claims priority, application Germany, June 20, 1968, P 16 46 311.9
Int. Cl. C06b 11/00
U.S. Cl. 149—19 9 Claims

A solid propellant charge for combined rocket-ram-jet engines contains a combination of compounds capable of yielding upon combustion an extremely high percentage of hydrogen and a high percentage of nitrogen, both calculated on the carbon present, said nitrogen-containing compound having cyano- or hydrazine groups capable of releasing high energy, said combination also including an oxidizer in an amount insufficient for complete combustion. The propellant charge has not only an unusually high effectiveness, but exhibits among others the advantage that during the rocket phase no carbon will be deposited as soot, including other combustible residues. The invention also discloses a process for producing the propellant charge.

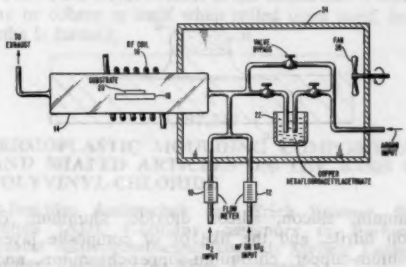
3,697,340
HOMOGENEOUS SOLID SOLUTION OXIDIZING COMPOSITION
Clyde J. Swedenberg, Oxon Hill, Md., and Manfred J. Cziesla, Washington, D.C., assignors to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed May 13, 1969, Ser. No. 826,081
Int. Cl. C06f 1/04
U.S. Cl. 149—19 15 Claims

A homogeneous solid solution oxidizing composition which is the result of the admixture of a hydroxylammonium salt and a hydrolyzed polymer or certain other polar polymer binder materials, e.g., polar polymers containing poly-hydroxyl, poly-amine, poly-ester and poly-carboxyl functionality.

3,697,341
COOL BURNING SMOKELESS POWDER COMPOSITION CONTAINING NITRAMINE ETHERS
Ronald Rosher and Ronald L. Simmons, Cumberland, Md., assignors to Hercules Incorporated, Wilmington, Del.
No Drawing. Filed Aug. 29, 1969, Ser. No. 855,463
Int. Cl. C06b 15/02
U.S. Cl. 149—92 6 Claims

Cool burning smokeless powder compositions providing high impetus with flame temperatures not exceeding about 2900° K. are disclosed. These smokeless powder compositions contain nitrocellulose, about 20% nitramine ether and optionally can contain nitramine azides.

3,697,342
METHOD OF SELECTIVE CHEMICAL VAPOR DEPOSITION
Jerome J. Cuomo, Bronx, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1970, Ser. No. 98,533
Int. Cl. B44d 1/02; C03c 15/00
U.S. Cl. 156—13 8 Claims

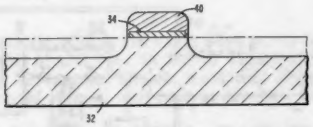


Metals are caused to be deposited selectively in the hydrogen reduction of their compounds which are either gaseous bearing or of adequate vapor pressure. The process is termed selective-chemical vapor deposition since the metal is deposited only on prepatterned areas of a substrate. The substrate is suitably a glass such as a borosilicate, boroalumino-silicate, phosphoaluminosilicate, phosphosilicate or soda-lime glass. The selective-chemical vapor deposition process occurs when two surfaces with different chemical reactivities are exposed to the chemical vapor deposition environment. The prepatterned areas provide one of these surfaces, such areas comprising a nucleation layer of a material such as chromium, tungsten, molybdenum, copper, aluminum, silicon, silicon dioxide, aluminum oxide, silicon nitride and the like, or a composite layer of chromium-copper, chromium-copper-chromium and the like. The other surface is provided by the remainder of the surface of the exposed substrate. The surface provided by the prepatterned area acts as a metal nucleation site while the glass surface is chemically eroded (ablated) and the metal does not nucleate thereon. An example of the process is the chemical reduction of copper hexafluoroacetylacetonate by hydrogen in the presence of hydrogen fluoride or sulfur hexafluoride in a reaction chamber. The chamber contains a substrate having a patterned nucleating layer thereon on which the reduced copper deposits while the substrate is ablated by the fluoride. The deposition reactions and simultaneous ablation reaction, acting in close proximity, are essential elements of the inventive process.

3,697,343
METHOD OF SELECTIVE CHEMICAL VAPOR DEPOSITION
Jerome J. Cuomo, Bronx, and Robert A. Laff, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1970, Ser. No. 98,534
Int. Cl. C03c 15/00
U.S. Cl. 156—13 8 Claims

Tungsten and other refractory metals such as molybdenum, tantalum, hafnium, zirconium, rhenium, etc. and metalloids such as silicon are caused to be deposited selectively by the hydrogen reduction of their fluorides and

chlorides. The process is termed selective-chemical vapor deposition since the metal is deposited only on prepatterned areas of a substrate. The substrate is suitably a glass such as a borosilicate, boroalumino-silicate, phospho-alumino-silicate, phospho-silicate or a soda-lime glass. The selective chemical vapor deposition process occurs when two surfaces with different chemical reactivities are exposed to the chemical vapor deposition environment. The prepatterned areas provided one of these surfaces, such areas comprising a nucleating layer of a material such as chromium, tungsten, molybdenum, copper,



aluminum, silicon, silicon dioxide, aluminum oxide, silicon nitrile, and the like or of composite layers of chromium-copper, chromium-copper-chromium, and the like. The other surface is provided by the remainder of the surface, i.e. the exposed surface of the substrate. The surface provided by the prepatterned area acts as a metal nucleation site while the substrate, i.e., the glass surface chemically erodes (ablates) and the metal does not nucleate thereon. In considering the mechanism of the inventive process, the deposition reactions and simultaneous ablation reactions acting in close proximity are an essential element thereof.

3,697,344

METHOD OF AND APPARATUS FOR LOCATING A BIT OF MATERIAL IN A PILE FABRIC

Stephen Temple, Cambridge, England, assignor to Durcam Research and Development Company Limited, London, England

Filed Dec. 8, 1970, Ser. No. 96,081
Claims priority, application Great Britain, Dec. 9, 1969, 60,135/69
Int. Cl. C09j *5/00*
U.S. Cl. 156—72 **15 Claims**

This invention relates to a method of and apparatus for delivering yarn bits or tufts to a backing sheet for producing a pile fabric. More particularly, a bit of material is delivered pneumatically to the backing sheet and the delivery air is separated from the bit prior to its location on the backing sheet to allow the bit to continue under its own inertia to its position on the backing sheet.

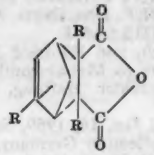
3,697,345

PROCESS FOR PREPARING POLYIMIDE LAMINATES

Robert W. Vaughan, Manhattan Beach, and Hyman R. Lubowitz, Hawthorne, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Continuation-in-part of application Ser. No. 738,403, June 20, 1968. This application Nov. 10, 1969, Ser. No. 875,523
The portion of the term of the patent subsequent to Feb. 23, 1987, has been disclaimed
Int. Cl. B32b *5/28, 31/12;* C09j *5/06*
U.S. Cl. 156—155 **12 Claims**

This invention is directed to a process for preparing reinforced resin laminates or plastic composites of improved thermal stability and low void content which comprises impregnating a substantially fibrous material e.g., glass fibers with an effective amount of an organic solution of a precursor of an imide prepolymer i.e., a polyamide-acid. The precursor-impregnated fibrous material is heated to a temperature ranging up to about 300° F. to remove part of the solvent and thereby obtain an intermediate product which may be characterized as having tack and drape. Subsequently, the polyamide-acid is imidized, in situ, to the prepolymer and cured by the application of heat e.g., temperatures ranging from about 250° F. to 700° F. and, with pressures ranging up to about 1000 p.s.i. Under these conditions, the prepolymer is cured to form a reinforced thermoset plastic composite. The precursor of the imide prepolymer i.e., the polyamide-acid is prepared by coreacting approximately stoichiometric amounts of at least one polyfunctional amine with a mixture of anhydrides consisting essentially of at least one polyfunctional anhydride and monoanhydride having the formula:



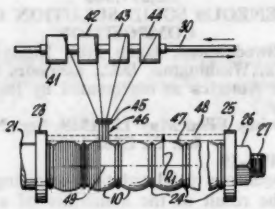
wherein R is selected from the group consisting of hydrogen and lower alkyl radicals having 1 to 5 carbon atoms per molecule.

3,697,346

METHOD OF MAKING A COMPOSITE PLASTIC BEARING

Horace B. Van Dorn, Kensington, Richard J. Matt, Simsbury, and Thomas P. Rolland, Bristol, Conn., assignors to Textron Inc., Providence, R.I.

Filed Dec. 1, 1970, Ser. No. 93,945
Int. Cl. B21c *13/00;* B65h *81/08;* B21d *53/10*
U.S. Cl. 156—161 **18 Claims**



The invention contemplates an improved sliding bearing, and method of making the same, wherein a low-friction fabric liner of non-cylindrical shape is part of an outer-ring member which has a sliding rotational interface with the matching surface of inner bearing-ring member.

According to the method of the invention, plural inner bearing-ring members are first arrayed upon a common support or mandrel. A braided sock of low-friction fabric is slipped over the inner-ring members and is axially elongated to cause the main body of the sock to conform generally with the external contour of the arrayed inner rings. Hardenable plastic such as epoxy or phenolic

is applied to impregnate the threads of the sock and to wet applied reinforcing threads of back-up layers, resulting in a single impregnated cylinder in which the liner material is held to the countour of all inner rings, for curing to ultimate hardness. Separate assembled bearings result from the radial cut-off between adjacent inner rings, and removal of the mandrel. Various further refining details are disclosed.

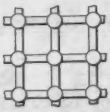
3,697,347

PROCESS OF PREPARING AIR-PERVIOUS SPOT-BONDED NONWOVEN FABRICS

Leonard T. Lehmann, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 610,855, Jan. 23, 1967. This application Dec. 22, 1969, Ser. No. 887,455

Int. Cl. D04h *1/58, 1/72*
U.S. Cl. 156—81 **5 Claims**



A process of forming air-pervious reinforced nonwoven fabrics comprises heating a nonwoven web in contact with a thermoplastic net material which has uniformly spaced thick portions connected by thinner strands. The temperature is sufficiently high to melt the net material, causing the strands to draw back into the thick portions making uniformly spaced spots of melted thermoplastic material.

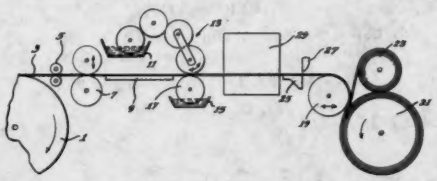
3,697,348

METHOD OF MAKING GASKETS

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co.

Filed July 9, 1969, Ser. No. 840,171

Int. Cl. B65h *81/02*
U.S. Cl. 156—190 **6 Claims**



A gasket having improved sealing properties and the method of forming such a gasket wherein a continuous strip or web of gasket material is wound on a core with the core having a cross-sectional configuration corresponding to the internal configuration of the gasket being made. The web material is wound upon itself and, in the preferred embodiment, has a series of intermediate bonding layers of a fluid-impermeable polymer material which in the end product form a plurality of parallel fluid barriers to produce effective sealing. The winding of the web material on the core and the application of the polymer material to the web provides a tube which is then cut into preselected thicknesses to provide individual gaskets. Additional polymer material may be provided on the cut or exposed surfaces of the gasket if desired. The cross-sectional thickness of the gasket is dictated solely by the convolute gasket material and the polymer material layer or layers. One aspect of the improved method consists in preparing a roll of the gasket material which is to be wound on the core with the base material having applied to one or both sides thereof an adhesive coating which has been dried, at least to the extent that it will not adhere or cohere to itself when rolled upon itself, before the tube is formed.

3,697,349

THERMOPLASTIC MOULDING COMPOSITIONS AND SHAPED ARTICLES ON THE BASIS OF POLYVINYL CHLORIDE

Hans-Joachim Andraschek and Erich Zentner, Burgkirchen (Alz), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 16, 1969, Ser. No. 867,078

Claims priority, application Germany, Oct. 19, 1968, P 18 04 049.8

Int. Cl. C08f *15/00;* **B29c** *17/00;* **B31f** *23/10*
U.S. Cl. 156—219 **3 Claims**

Emulsion graft polymers on the basis of vinyl chloride containing specific amounts of known elastomer components are used for the manufacture of plasticizer-free films, sheets or shaped articles which undergo a permanent change in color by deformation, preferably beyond the yield point. The films are especially suitable for labeling and decorating purposes.

3,697,350

METHOD OF MAKING AN ENAMELED DECORATIVE BOARD

Akira Yamanouchi, Neyagawa-shi, Seisuke Takenaka, Kadoma-shi, and Yukio Mitori, Neyagawa-shi, Japan, assignors to Matsushita Kenko Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed June 10, 1969, Ser. No. 831,988

Claims priority, application Japan, June 25, 1968, 43/44,320

Int. Cl. B29c *19/00*
U.S. Cl. 156—245 **4 Claims**

The present invention relates to an enameled decorative board prepared by fixing, with adhesive in between an enameled aluminum sheet on a base material made of veneer boards, fiber boards, asbestos boards or laminate of paper or cloth dipped into a thermosetting resin solution, and by drying the composite board. The decorative board of this invention can be advantageously produced by placing an enameled aluminum sheet prepared by melt-baking frit of a low melting point on the surface of the aluminum onto said base material, and then by placing damper layer provided on the enameled surface and a suppression plate on the damper layer, to be pressed together.

The thus prepared enameled decorative board has excellent resistance against water, heat, light, and corrosion, and the enameled surface is beautiful; therefore, it is especially effective as a decorative board for outdoor use.

3,697,351

METHOD OF BONDING HOLLOW FIBERS TO PLASTIC RESIN SUPPORTS BY RADIATION GRAFTING

David E. Harmer, Midland, Mich., John R. Jarema, Indianapolis, Ind., and Douglas E. Leng, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 19, 1968, Ser. No. 714,349

Int. Cl. B29c *19/02*

U.S. Cl. 156—272 7 Claims

The bond between a plastic resin support or header and a hollow fiber embedded therein is improved by forming a graft polymer bond between the resin and the fiber. The graft polymer bond is formed by curing the resin with high energy radiation.

3,697,352

BONDING AND ASSEMBLING PROCESS BY A MAGNETIC FORCE

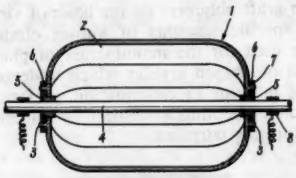
Hideo Itokawa, Tokyo, Japan, assignor to Taiyo Kogyo Company Limited, Tokyo, Japan

Filed Jan. 15, 1969, Ser. No. 791,260

Claims priority, application Japan, Jan. 19, 1968, 43/3,048

Int. Cl. H01f *13/00*

U.S. Cl. 156—272 7 Claims



This invention is a method wherein a ferromagnetic substance is used for the bonded parts of small divided pieces to be bonded together, said pieces are bonded together by flowing an instantaneous electric current to it and the respective pieces are separated from each other by flowing the electric current in a direction reverse to that of the above mentioned current.

3,697,353

PROCESS FOR BONDING TWO SOLID ARTICLES TOGETHER IN WHICH A CATALYZED UNSATURATED POLYESTER RESIN IS USED IN COMBINATION WITH A PROMOTED UNSATURATED POLYESTER RESIN

Rene Robert Brochu, Fairfield, Conn., and Lytton Taylor, Guilford, N.C., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 17, 1970, Ser. No. 20,383

Int. Cl. B32b *7/10*

U.S. Cl. 156—310 10 Claims

A process for bonding two solid articles together comprising coating the surface of one of the articles with a catalyzed unsaturated polyester resin, coating the surface of the other article with a promoted unsaturated polyester resin and bringing each of the coated surfaces into direct contact with one another.

3,697,354

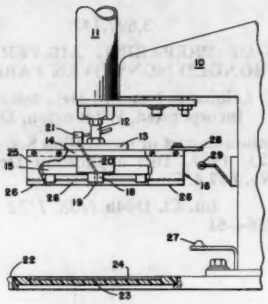
STAY FUSING MACHINE

Fred A. Brown III, Ballston Spa, and Roger Le Mere, Petersburg, N.Y., assignors to Cluett, Peabody & Co., Inc., Troy, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,059

Int. Cl. B29c *19/02;* B65c *9/08*

U.S. Cl. 156—380 3 Claims



Improved stay fusing machine for attaching stays to collars, the machine including self-shielding features and angled stay feed. The machine is adapted for use with long stays.

3,697,355

UREA-ALDEHYDE RESIN ADHESIVE PROCESS

William Raymond Black, Springfield, Oreg., assignor to The Borden Company, New York, N.Y.

No Drawing. Filed Feb. 6, 1969, Ser. No. 797,253

Int. Cl. C09j *3/16*

U.S. Cl. 156—319 2 Claims

This invention relates to the method of bonding water-pentrable cellulosic substrates with urea-aldehyde resin adhesives as illustrated by bonding of wood flakes into particle boards, and in particular to a method of improving the efficiency of said adhesives, which comprises replacing from about 1% up to about 35% by weight of the resin solids by a salt selected from the group consisting of alkali and alkaline earth halides and mixtures thereof; and to the resultant products.

3,697,356

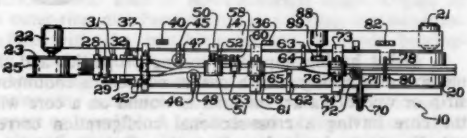
MANUFACTURE OF WINDSHIELD WIPER BLADES

Mathew Kuts, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Apr. 19, 1971, Ser. No. 135,092

Int. Cl. B32b *3/04*

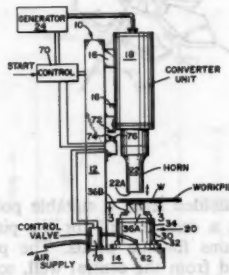
U.S. Cl. 156—467 8 Claims



An apparatus for making a distendable stationary window wiper blade which is suitable for cleaning a mov-

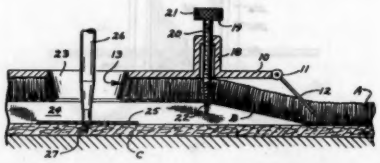
able window as in station wagons. The blade is distendable by fluid pressure to simultaneously press the wiper blade against the window and spray liquid against the window to provide means for lubricating and wetting the window. Such wiper blade is made by encasing a tube with fabric reinforced material and setting a bead centrally along the central length thereof.

3,697,357
ULTRASONIC SEALING APPARATUS
Edward G. Obeda, Brookfield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.
Filed July 17, 1970, Ser. No. 55,886
Int. Cl. B33b *31/00*
U.S. Cl. 156—510 **2 Claims**



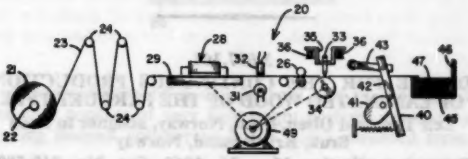
An ultrasonic buttonhole apparatus comprises an ultrasonic generator, a converter with horn, and a stationary anvil. The anvil is provided with a patterned face to cause a frame-like fused portion and with a movable slitting means which is raised during a portion of the sealing (weld) cycle, thereby causing selective fusing of the workpiece interposed.

3,697,358
APPARATUS FOR REPAIRING DAMAGED CARPETING
Jacob A. Ronning, 3525 Irving Ave. S., Minneapolis, Minn. 55408
Original application July 27, 1967, Ser. No. 656,482, now Patent No. 3,558,386. Divided and this application Aug. 27, 1970, Ser. No. 67,541
Int. Cl. B32b *31/04, 31/18, 31/20*
U.S. Cl. 156—514 **4 Claims**



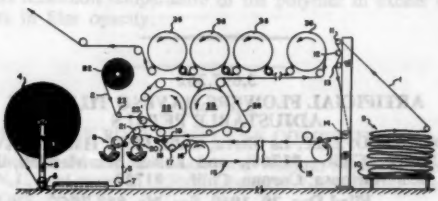
Apparatus for use in repairing spot damaged carpeting including a plate for disposition on the carpeting with an aperture exposing the damaged area and for guiding a cutting tool therethrough, with means attaching the plate to the carpeting to lift a portion of the same above the underlying floor to facilitate the passage of a member for securing a section of undamaged carpeting in the opening from which the damaged section has been cut.

3,697,359
METHOD OF ATTACHING HANDLES TO FILM BAGS
William E. Javarey, Jr., Glocester, and Richard C. Adams, West Barrington, R.I., assignors to G. T. Schjeldahl Company, Northfield, Minn.
Filed Dec. 29, 1969, Ser. No. 888,224
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—518 **5 Claims**



Apparatus for bonding a pair of handles from superimposed continuous webs of handle blanks onto the open end of a bag structure formed of flexible heat sealable film, the apparatus comprising web handling means adapted to draw a continuous bag forming web of flexible film onto the upper surface of a web support assembly, and second web handling means adjacent the first web handling means adapted to draw superimposed continuous webs of handle blank pairs along the upper surface of a second web supporting assembly and into predetermined disposition relative to said bag forming retention or web, and means for forming knock-out ears partially through said superimposed handle blanks with the ear in the upper handle blank being retained within the corresponding opening formed in the lower handle blank so as to releasably retain the handle blank pairs in predetermined superimposed relationship for bonding to the continuous web of flexible film.

3,697,360
METHOD FOR MAKING SANDWICH LAMINATIONS IN ONE PASS
Terrance L. Chamberlain, Corinna, Richard P. Sears, Abbot Village, and Ivan H. Fletcher, Jr., Newport, Maine, assignors to Coin Sales Corporation
Filed Dec. 4, 1969, Ser. No. 882,147
Int. Cl. B32b *31/08, 31/20*
U.S. Cl. 156—551 **1 Claim**



Method for bonding two moving webs of a cover material to opposite sides of a moving web of a core material including means for applying discrete portions of

adhesive to the surface of one of the webs of cover material and to one of the surfaces of the core material, means for bringing the two moving webs of cover material into contact with the moving web of core material and means for holding all the webs together while subjecting the adhesive to heat in order to cure the adhesive in one pass through the apparatus.

The method of bonding two webs of a cover material to opposite sides of a moving web of core material comprising the steps of applying discrete portions of adhesive to one surface of the web of core material and discrete portions of adhesive to one side of one web of cover material, bringing a web of cover material into contact with each side of the web of core material and compressing the resultant laminate of webs together while subjecting the laminate to heat in order to cure the adhesive.

3,697,361

DEVICE FOR THE CONTINUOUS PRODUCTION OF LAMINATED WOOD OF THE PARQUET TYPE

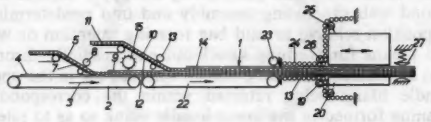
Leif Thorvald Olsen, Boen, Norway, assignor to Boen Bruk, Kristiansand, Norway

Original application Mar. 26, 1969, Ser. No. 810,589. Divided and this application Oct. 22, 1970, Ser. No. 83,024

Claims priority, application Norway, Apr. 1, 1968, 1,252/68; June 27, 1968, 2,554/68; Feb. 11, 1969, 526/69

Int. Cl. B27d *3/00;* B32b *31/20*

U.S. Cl. 156—558 **2 Claims**



The invention relates to a process for the step by step pressing of material which is fed continuously, particularly wood laminate such as laminated parquet, and the like, in which the pressing is carried out by means of a press which can move to and fro in the feed direction of the material and supported by rollers or wheels. The press carries out the pressing and the heating of the laminate in order to harden the glue while moving in the feed direction of the material and which is open during the return movement, and the press is pushed forward by the material sheet itself and one thereby achieves a desired mutual compression of the lamellae in the horizontal direction.

3,697,362

ARTIFICIAL FLOWERS HAVING TILTABLY ADJUSTABLE PETALS

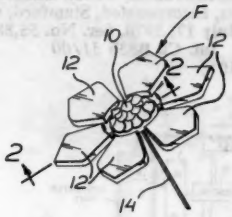
Ronald S. O. Zane, La Sierra, Calif. (2572 Hammer Ave., Norco, Calif. 91760), and Lester W. Mendell, Jr., 1432 Mariposa, Corona, Calif. 91720

Filed Dec. 29, 1969, Ser. No. 888,796

Int. Cl. A01n *3/00;* A41g *1/00;* A47g *33/04*

U.S. Cl. 161—30 **6 Claims**

An artificial flower having a plastic center, or pistil, and plastic petals spaced outwardly from, and arranged evenly around, the periphery of the pistil. The petals are connected to the pistil by means of flexible "stems" of dead-soft character. These stems are of U-shaped configuration and comprise the outer portions of the legs of a spider-like member, the central part of which is embedded in the flower pistil. Each of the legs extends laterally from a common center a fixed distance, then is bent to extend perpendicularly through the bottom of the pistil and formed into the shape of a U, the outer terminus of which is embedded in the inner end of one of the flower petals. As a result, each of the flower petals has a U-shaped stem which permits it to be tilted through a relatively wide arc.



The flower is molded from a suitable polyester resin in a mold having a central well for the pistil and surrounding depressions for the petals. The petal depressions are separated from the central well, so there is no channel for resin flow therebetween. The legs of the spider-like member are shaped to permit the central portion of the member to fit into the central well in the mold, with each leg extending radially from a central hub, then curving upwardly over the rim of the well, and downwardly into one of the petal depressions.

3,697,363

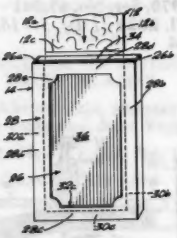
PANEL ASSEMBLY FOR FURNITURE CONSTRUCTION

Jorge Sueiras Martinez, 961 W. 36th Terrace, Hialeah, Fla. 33012

Filed Nov. 2, 1970, Ser. No. 86,121

Int. Cl. A47b *47/04;* B32b *1/04*

U.S. Cl. 161—44 **8 Claims**



A single panel assembly of the invention may be embodied in a furniture piece, a counter top or other planar wall or construction element. The panel assembly includes a base panel and at least one thin broad decorative display panel adapted for selective use with the base panel. The display panel is adapted for quick attachment and detachment flatwise over the base panel; sliding display

panel means or magnetic attraction means are provided for ready removal and replacement of a display panel on a base panel for changing the color pattern of decorative design of a furniture piece, counter top fixture or the like.

3,697,364

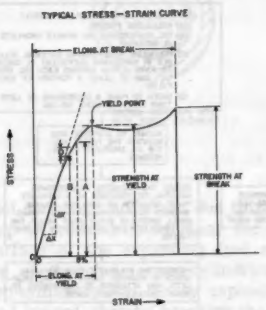
DISCONTINUOUS CELLULOSE REINFORCED ELASTOMER

Kamel Boustany and Aubert Yaucher Coran, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 16, 1970, Ser. No. 29,033

Int. Cl. B32b *5/00*; B60c *1/00*

U.S. Cl. 161—59 **15 Claims**



Bonded composites of discontinuous cellulose and vulcanizable elastomer having modulus and strength sufficiently high for use as replacements for composites from continuous fiber.

3,697,365

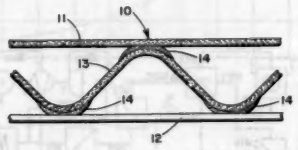
RIGID-WHEN-WET BOXBOARD

Abraham J. Reisman, Springfield, Mass., and Thomas B. Wilkinson III, Houston, Tex., assignors to Alton Box Board Company, Alton, Ill., and Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 647,624, June 21, 1967. This application Feb. 25, 1971, Ser. No. 119,009

Int. Cl. B32b *3/28, 9/06, 29/06*

U.S. Cl. 161—133 **8 Claims**



Corrugated containerboard of the type adapted to be rigid when wet having at least one sheet of the board structure impregnated with a mixture of resole type phenolic resin and an organo silyl compound and procedure for making.

3,697,366

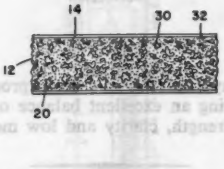
LIGHTWEIGHT GYPSUM PANEL

George H. Harlock and Edward A. Burkard, East Amherst, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,755

Int. Cl. B32b *13/00*

U.S. Cl. 161—159 **10 Claims**



Gypsum wallboard in which about half the volume of the core consists of very lightweight particles formed by tearing foamed polystyrene beads into a shredded form.

3,697,367

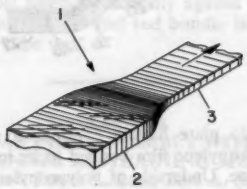
LOW DENSITY COMPOSITE POLYMER FILM

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1969, Ser. No. 889,481

Int. Cl. B29d *27/00*

U.S. Cl. 161—168 **5 Claims**



An opaque microporous film suitable as paper and capable of being printed. The film has at least two polymers which are incompatible with each other and one polymer which is in excess has a glass transition temperature at least 40° C. lower than that of another polymer with which it is incompatible. Drawing at about the glass transition temperature of the polymer in excess results in film opacity.

3,697,368

POLYAMIDE-POLYETHYLENE COMPOSITE FILMS

Mahendra Bhuta, Mendham, and William Sacks, Gillette, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

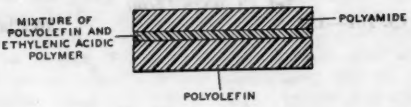
Filed Feb. 26, 1971, Ser. No. 119,325

Int. Cl. B32b *27/08, 27/34*; C09j *3/14*

U.S. Cl. 161—227 **12 Claims**

Composite films are provided by coextruding a polyamide with at least one combination of polymeric materials selected from the group of (1)(a) an ethylenic

acidic polymer and (b) a polyolefinic hydrocarbon; or (2) a mixture of an ethylenic acidic polymer and a polyolefinic hydrocarbon or (3)(a) a mixture of an ethylenic acidic polymer and a polyolefinic hydrocarbon and (b)



a polyolefinic hydrocarbon in a novel process which provides films having an excellent balance of properties including high strength, clarity and low moisture and gas permeability.

3,697,369

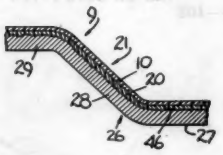
PLASTIC LINED RECEPTACLE OR THE LIKE

Stephen W. Amberg, St. James, N.Y., and Ralph G. Amberg, Monticello, Ind., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of application Ser. No. 445,926, Apr. 6, 1965, which is a continuation-in-part of application Ser. No. 415,930, Dec. 4, 1964. This application Dec. 10, 1969, Ser. No. 880,485

Int. Cl. B32b *27/10*; B65d *5/56*

U.S. Cl. 161—250 **16 Claims**



Molded pulp plate having continuous and unseamed liner of polypropylene film bonded to its interior surfaces by polyethylene. Underside of polypropylene film may be printed with decorative design. Method includes clamping a sheet of polypropylene film, having polyethylene coating on its underside surface, against the mouth rim of the plate; heating the plate and film to a temperature which is above the softening point temperature of the polyethylene material but below the softening point temperature of polypropylene; and drawing a vacuum through the bottom of the plate to press the film against the interior surfaces of the plate.

3,697,370

METHOD FOR MANUFACTURE OF DRY STRENGTH PAPER CONTAINING METHYLAMINE-EPICHLOROHYDRIN POLYMER

Daniel Elmer Nagy, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Application May 22, 1970, Ser. No. 39,874, which is a division of application Ser. No. 778,934, Nov. 26, 1968, now Patent No. 3,567,659. Divided and this application Dec. 8, 1970, Ser. No. 96,191

Int. Cl. D21h *3/38*

U.S. Cl. 162—164 **3 Claims**

A cationic, water-soluble, storage-stable, methylamine-epichlorohydrin polymer is prepared by reacting a quantity of a methylamine-epichlorohydrin polymer which is well below its gel point with successively added small amounts of epichlorohydrin until the polymer nears the stage at which it is an irreversible gel, and then reacting the polymer with sufficient methylamine to inactivate substantially all amine reactive epichlorohydrin residues present. At least the last step of the reaction is performed at a temperature at which a particle depolymerization of the polymer occurs.

3,697,371

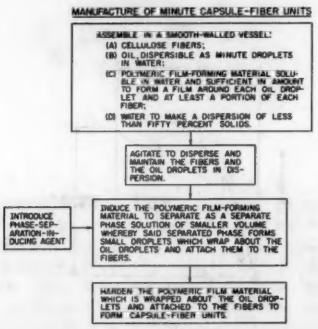
CAPSULE-FIBER UNIT MANUFACTURE

Lowell Schleicher, Xenia, and Robert E. Miller and Erland C. Porter, Jr., Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Feb. 12, 1971, Ser. No. 114,929

Int. Cl. D21d *3/00*

U.S. Cl. 162—183 **10 Claims**


MANUFACTURE OF MINUTE CAPSULE-FIBER UNITS
ASSEMBLE IN A SMOOTH-WALLED VESSEL:
(A) CELLULOSE FIBERS;
(B) OIL, DISPERSIBLE AS MINUTE DROPLETS IN WATER;
(C) POLYMERIC FILM-FORMING MATERIAL SOLUBLE IN WATER AND SUFFICIENT IN AMOUNT TO FORM A FILM AROUND EACH OIL DROPLET AND AT LEAST A PORTION OF EACH FIBER;
(D) WATER TO MAKE A DISPERSION OF LESS THAN FIFTY PERCENT SOLIDS.
AGITATE TO DISPERSE AND MAINTAIN THE FIBERS AND THE OIL DROPLETS IN DISPERSION.
INTRODUCE PHASE-SEPARATION-INDUCING AGENT
INDUCE THE POLYMERIC FILM-FORMING MATERIAL TO SEPARATE AS A SEPARATE PHASE SOLUTION OF SMALLER VOLUME WHEREBY SAID SEPARATED PHASE FORMS SMALL DROPLETS WHICH WRAP ABOUT THE OIL DROPLETS AND ATTACH THEM TO THE FIBERS.
HARDEN THE POLYMERIC FILM MATERIAL WHICH IS WRAPPED ABOUT THE OIL DROPLETS AND ATTACHED TO THE FIBERS TO FORM CAPSULE-FIBER UNITS.

A process of manufacture of minute capsule-fiber units, en masse, comprising the steps of (1) dispersing cellulose fibers and oil material as droplets in an aqueous solution of a film-forming polymeric material, (2) changing the conditions of the solution to make the polymeric material less soluble so as to give an emergent coacervate phase of polymeric material which wraps the oil droplets and attaches them to the fibers to give capsule-fiber units and (3) hardening the polymeric material of the capsule-fiber units.

3,697,372

NUCLEAR REACTOR INSTALLATION

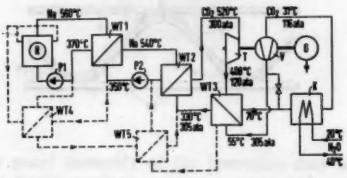
Hans-Peter Schabert, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 14, 1968, Ser. No. 767,126

Claims priority, application Germany, Oct. 13, 1967, P 16 01 004.1

Int. Cl. G21d *1/02*

U.S. Cl. 176—60 **9 Claims**



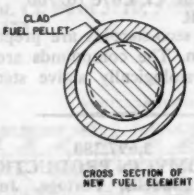
Nuclear reactor installation for power production includes a gas turbine circulatory system operating with a nonideal gas such as CO_2 and having a compressor stage

supplied at full-load operation with noncondensed working medium having a density of at least 200 kg./m.^{3} and preferably at supercritical pressure and substantially critical temperature.

3,697,373
NUCLEAR FUEL ELEMENT

Donald E. Emon, Rockville, and Donald R. Riley, Potomac, Md., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed June 2, 1970, Ser. No. 42,660
Int. Cl. G21c *3/18*
U.S. Cl. 176—68 **8 Claims**

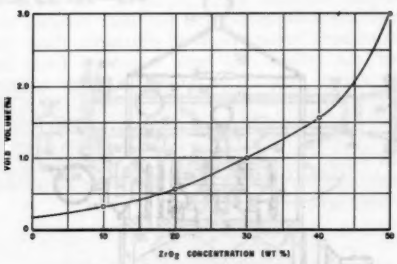


Overall fuel element clad strain due to fuel expansion during burnup is reduced by breaking the symmetry of the outer surface of the expanding fuel material. The inner surface of the clad is non-cylindrical so that at points of non-symmetry the slowly expanding fuel material is forced inward, thereby breaking the symmetry of the expanding fuel material and thus forming stress relieving paths.

3,697,374
GRADIENT-TYPE NUCLEAR FUEL PLATE

Rodney W. Knight, Melvin M. Martin, and William R. Martin, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 3, 1970, Ser. No. 86,576
Int. Cl. G21c *3/20*
U.S. Cl. 176—69 **5 Claims**

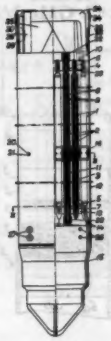


Gradient-type nuclear fuel plates exhibiting minimal blister formation are provided by introducing an inert ceramic dispersoid into the filler material of the fuel plate, said dispersoid providing a void volume of between about 2–4 volume percent in said filler material. In one embodiment a gradient-type nuclear fuel plate comprising an aluminum-base dispersion fuel clad with aluminum metal is prepared wherein the dispersoid is alpha-phase Al_2O_3.

3,697,375
FUEL ASSEMBLY FOR INSERTION FROM ABOVE INTO A NUCLEAR REACTOR CORE

Antti Suvanto and Aart van Santen, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 24, 1969, Ser. No. 793,812
Claims priority, application Sweden, Dec. 2, 1968, 16,411/68
Int. Cl. G21c *3/32*
U.S. Cl. 176—78 **13 Claims**

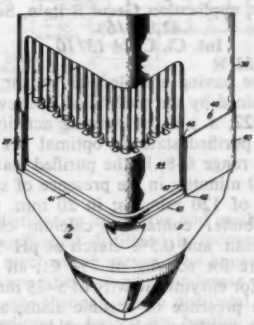


In a fuel assembly for insertion from above into a nuclear reactor core a fuel rod bundle is arranged as a freely removable loose insert in a weight-carrying square sheathing tube, which has at its upper end connection members such as two diametrically opposed lifting lugs permitting a grab member in a lifting device to grab the sheathing tube for lifting the entire fuel assembly. The upper part of the sheathing tube is formed as springs supporting the fuel assembly laterally against an upper core grid and supporting the fuel rod bundle laterally against the sheathing tube wall.

3,697,376
NUCLEAR FUEL ASSEMBLY WITH FLOW CHANNEL RESTRAINING MEANS

Carl R. Mefford, James L. Lass, Bart A. Smith, Dominic A. Venier, and Thomas Trocki, San Jose, Calif., assignors to General Electric Company

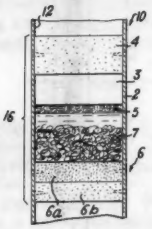
Filed Aug. 15, 1969, Ser. No. 850,483
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **9 Claims**



A nuclear fuel assembly incorporating a restraining arrangement for engaging the flow channel and limiting its

deflection away from the lower tie plate to control the bypass flow of coolant into the spaces between the fuel assemblies of a nuclear reactor.

3,697,377
VENTED NUCLEAR FUEL ELEMENT
Maurice Gauthron, Paris, France, assignor to Commissariat a l'Energie Atomique
Filed July 8, 1968, Ser. No. 743,125
Claims priority, application France, July 13, 1967, 114,361
Int. Cl. G21c *3/10*
U.S. Cl. 176—79 **16 Claims**



A vented fuel element for a nuclear reactor of the liquid-metal cooled type is designed to prevent the penetration of the liquid metal coolant into the fuel element can through the fission-gas discharge vent.

The vent according to the invention comprises a compartment which is separated from the can interior by a first porous plug and from the liquid metal by a second porous plug.

The liquid metal which has passed through the second plug is intended to transport a powdered product which is present within the compartment either into the first plug which is thereby rendered impermeable to the liquid metal or in the direction of the second plug so as to bring the powdered product into contact with the second plug and thus permit the discharge of fission gases.

3,697,378
DEXTRINIZATION OF STARCH WITH α-AMYLASE FROM *BACILLUS COAGULANS*
Henry M. Smalley, Ulverston, England, assignor to Glaxo Laboratories Limited, Middlesex, England
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,197
Claims priority, application Great Britain, Sept. 9, 1968, 42,856/68
Int. Cl. C12d *13/10*
U.S. Cl. 195—31 R **19 Claims**

An α-amylase having a molecular weight of 11,000± 1000 as determined by the method of Andrews, Biochem. J. 1964, 91, 222; a pH for optimal activity at 37° C. of 4.8; in the purified state an optimal pH for thermal stability in the range 6–8; in the purified state a half-life at 90° C. of 90 minutes; in the presence of starch a half-life at 90° C. of 120 minutes; in 20 mm. glycerophosphate/acetate buffer containing calcium chloride at a molarity of 5 mm. and 0.5% starch at pH 5–7, an optimal temperature for activity of 75° C.; an optimal calcium molarity for enzymic activity of 5–25 mm.; enhanced stability in the presence of organic acids; ability to degrade starch to produce polysaccharides consisting of 6 glucose units; ability to attack the cycloheptylamylose system in Schardinger β-dextrins; and a mobility of 5 cm. towards the anode on gel electrophoresis for 16 hours at 4° C. at 400 volts and 20 ma. on 5% polyacrylamide gel in tris-borate-EDTA buffer at pH 8.7.

The α-amylase is prepared by submerged aerobic culture of *B. coagulans* strain NCIB 10278 or a mutant thereof in a nutrient medium and isolating the enzyme therefrom. The enzyme is used for the dextrinisation of starch in an aqueous medium at a temperature of 80° C. or greater.

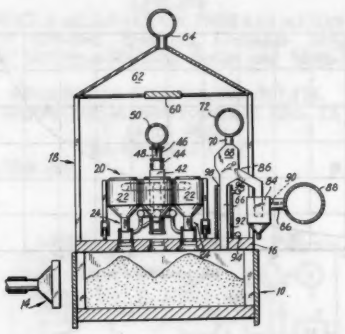
3,697,379
ASYMMETRIC REDUCTION OF SECO-STEROIDS
George C. Buzby, Jr., Philadelphia, George Greenspan, Narberth, and Emmett L. Buhle, Media, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Apr. 28, 1970, Ser. No. 32,727
Int. Cl. C07c *167/00*
U.S. Cl. 195—51 R **6 Claims**

Optically active seco-steroids are prepared by microbiological reduction. The compounds are useful in the production of physiologically active steroids.

3,697,380
LINCOMYCIN PRODUCTION
Alexander D. Argoudelis, Portage, John H. Coats, Kalamazoo, and Thomas R. Pyke, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,141
Int. Cl. C12d *9/00*
U.S. Cl. 195—80 R **3 Claims**

A microbiological process for preparing the antibiotic lincomycin without the concomitant production of lincomycin B (4′-depropyl-4′-ethyllincomycin). The absence of lincomycin B in the fermentation beer results in increased lincomycin recovery efficiency from the fermentation beer.

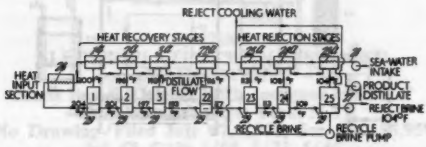
3,697,381
METHOD AND APPARATUS FOR POLLUTION-FREE CHARGING OF COKE OVENS
Roland Kemmetmueller, Pittsburgh, Pa., assignor to American Waagner-Biro Company, Inc., Pittsburgh, Pa.
Filed Feb. 7, 1972, Ser. No. 224,157
Int. Cl. C10b *27/04*
U.S. Cl. 201—40 **21 Claims**



A method and apparatus for carrying out pollution-free charging of coke ovens. During introduction of a charge into a coke oven from a larry car gas which escapes through the larry car connections to the coke oven is collected with a suitable gas-collecting pipe. Standpipes which communicate with the interior of the coke ovens communicate with a second gas-collecting pipe so that additional

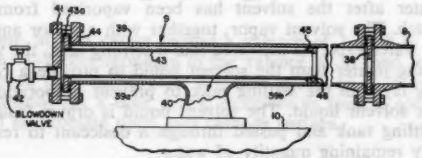
gas escaping from the interior of the coke ovens is collected. The entire space over the coke ovens is enclosed and the interior of the enclosure communicates with a third gas-collecting pipe in which gas is collected from the space over the coke ovens. All of this collected gas is cleaned before being discharged to the outer atmosphere.

3,697,382
METHOD OF AND APPARATUS FOR THE MULTI-FLASH DISTILLATION OF LIQUIDS
Andrew Porteous, Bearsden, Dunbartonshire, Scotland, assignor to National Research Development Corporation
Filed Nov. 17, 1969, Ser. No. 877,145
Claims priority, application Great Britain, Nov. 19, 1968, 5,483/68
Int. Cl. B01d *3/10, 3/06, 3/02*
U.S. Cl. 202—173 **2 Claims**



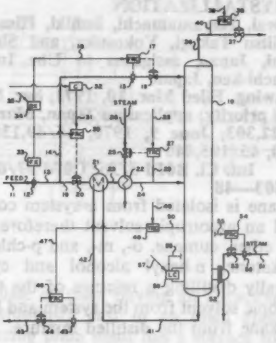
The invention relates to the multi-flash distillation of liquids wherein distillation is effected by a plant comprising a series of distillation stages each having a heat exchanger and associated flash chamber, a heater introduced between the final heat exchanger and the first flash chamber, the heater and flash chambers being all connected in series and means by which the pressure is reduced in successive chambers.

3,697,383
FEEDWATER HEATER AND STRAINER ARRANGEMENT FOR MULTIPLE-EFFECT THIN FILM DESALINATION PLANT
Earle R. Weaver, Topsfield, Mass., assignor to General Electric Company
Filed Dec. 14, 1970, Ser. No. 97,729
Int. Cl. B01d *1/26, 3/00, 3/02, 3/08, 3/28, 21/24*
U.S. Cl. 202—174 **7 Claims**



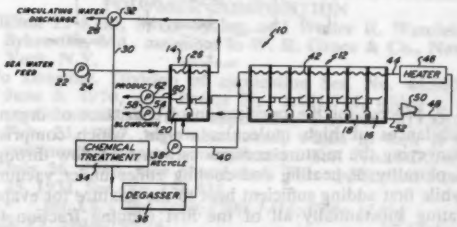
A vertical double fluted tube evaporator for water desalination has multiple closely-coupled effects with individual feedwater heaters in each effect. Feedwater manifolds in each effect supply feedwater to double fluted tubes through individual porcelain spray nozzles providing thin films on the tubes. The feedwater heaters are fed in series through each effect, while parallel branch lines supply the manifolds via in-line strainers with provisions for blow-down during normal operation if strainer blockage occurs.

3,697,384
FRACTIONATION CONTROL SYSTEM AND PROCESS WITH PLURAL FEED STREAM CONTROLS
Harry L. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 12, 1969, Ser. No. 823,699
Int. Cl. B01d *3/42*
U.S. Cl. 203—1 **7 Claims**



Method and apparatus for controlling the fractional distillation of a fluid mixture by separating the total feed stream into two streams, regulating the flow rate of each stream, heating one of the streams, delivering each stream into a distillation column at spaced locations, regulating the flow of fluid from the column, and regulating the temperature within the column.

3,697,385
FLASH DISTILLATION APPARATUS AND METHOD
Robert A. Tidball, Swarthmore, Pa., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Oct. 6, 1970, Ser. No. 78,534
Int. Cl. B01d *3/00, 3/02, 3/10*
U.S. Cl. 203—11 **9 Claims**



A flash distillation apparatus and method wherein fluid energy in unflashed distilland is recovered in the form of useable mechanical energy. The apparatus has a series of flash evaporation stages, condenser tubes associated with the stages through which distilland passes as a condensing medium, a heater for heating of the distilland after it emerges from the condenser tubes, a pump for circulating the distilland, and a turbine for receiving heated distilland prior to flashing of the distilland. The

turbine serves to reduce distilland pressure prior to introduction of the distilland into a first distillation stage, and to produce mechanical energy which may be used to supply the energy requirements of the apparatus.

3,697,386

METHOD OF ISOLATING TETRAOXANE BY AZEOTROPIC DISTILLATION AND CRYSTALLIZATION

Tadashi Iwai, Hayamamachi, Isshiki, Hisao Yamashina, and Teiitsu Takagi, Yokosuka, and Shoichi Adachi, Zushi-shi, Japan, assignors to Ube Industries Ltd., Yamaguchi-ken, Japan

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,072
Claims priority, application Japan, Mar. 18, 1970, 45/22,303; June 9, 1970, 45/49,136; Dec. 1, 1970, 45/105,440
Int. Cl. B01d *3/36*; C07d *21/00*
U.S. Cl. 203—48 4 Claims

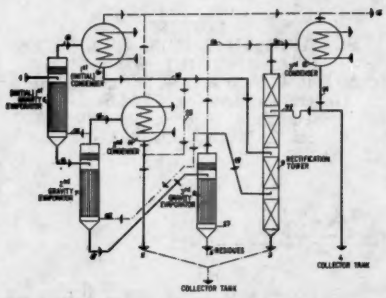
Tetraoxane is isolated from a system containing tetraoxane and an azeotropic solvent therefore selected from di-n-butyl ether, cumene, o-, m-, and p-chlorotoluene, diisobutyl ketone, n-hexyl alcohol and cyclooctane by azeotropically distilling a mixture of the tetraoxane and the azeotropic solvent from the system and by crystallizing the tetraoxane from the distilled mixture.

3,697,387

PROCESS AND DEVICE FOR THE PURIFICATION OF A MIXTURE OF ORGANIC SUBSTANCES OF HIGH MOLECULAR WEIGHT

Hans Joachim Munch, Frankendorf, Switzerland, assignor to Buss A.G., Basel, Switzerland

Filed May 13, 1969, Ser. No. 824,071
Claims priority, application Sweden, May 16, 1968, 7,504/68
Int. Cl. B01d *3/04, 3/10*
U.S. Cl. 203—72 8 Claims



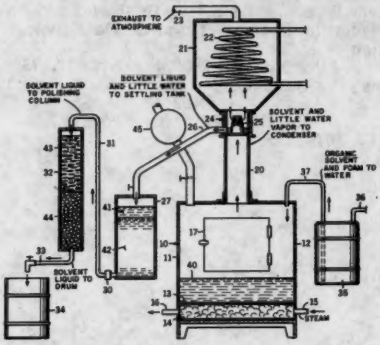
A process for the purification of a mixture of organic substances of high molecular weight, which comprises conveying the mixture continuously in even flow through a plurality of heating and cooling zones under vacuum, while first adding sufficient heat to the mixture for evaporating substantially all of the first running fraction together with a small portion of the middle fraction, thereafter subjecting the distillate so obtained to rectification so as to obtain a pure product of first quality, which is withdrawn, and a slightly impure product of second quality, and continuing the purification process by evaporating the residual mixture remaining after withdrawal of the first-quality product, in additional heating stages followed by condensations, to obtain further amounts of first-quality products, the heat energy of the hot vapors and the hot condensates being utilized for said rectification. The invention also comprises a device for carrying out the above process.

3,697,388

PROCESS OF RECLAIMING A LIQUID ORGANIC SOLVENT FROM A FOAM CONTAMINANT

Willis S. Hobson and John T. Gregory, Seymour, and Clarence H. Kleinhaus, Columbus, Ind., assignors to Seymour Manufacturing Co., Seymour, Ind.

Filed Nov. 6, 1969, Ser. No. 874,659
Int. Cl. B01d *3/36*
U.S. Cl. 203—96 7 Claims


EXHAUST TO ATMOSPHERE
SOLVENT LIQUID TO POLISHING COLUMN
SOLVENT LIQUID AND LITTLE WATER TO SETTLING TANK
SOLVENT AND LITTLE WATER VAPOR TO CONDENSER
ORGANIC SOLVENT AND FOAM TO WATER
SOLVENT LIQUID TO DRUM
STEAM

The process of reclaiming a liquid organic solvent from a foam contaminant consisting of a synthetic polymer mixed with a catalyst to form a foam, in which a quantity of liquid is placed into a still pot, the liquid being one that has a boiling point that is greater than that of the solvent, and feeding the solvent and foam contaminant mixture into the still pot liquid that has been heated to a temperature above the boiling point of the solvent yet below the boiling point of the liquid whereby the solvent vaporizes, the solvent vapor being passed through a condenser and the resultant solvent liquid being recovered. The solvent can be a chlorinated solvent of a class including methylene chloride, trichloroethylene and methyl chloroform, the still pot liquid can be water, and the foam contaminant can be of a class including polyurethane foam and polystyrene foam. The solvent and foam contaminant mixture is fed into the heated water above the liquid level and at a rate determined by the capacity of the condenser. The amount of water provides sufficient depth to cover the batch of solvent and contaminant mixture fed into the pot, the foam contaminant being removed physically from the water after the solvent has been vaporized from the batch. The solvent vapor, together with a minor amount of water vapor, is delivered into a settling tank, the water being lighter than the solvent liquid to provide a covering layer in the settling tank to prevent evaporation of the solvent liquid. The solvent liquid is drawn from the settling tank and passed through a desiccant to remove any remaining quantity of water.

3,697,389

METHOD OF FORMING ELECTRICAL CONTACT MATERIALS

Wayne John Jacobs and Robert William Fritz, Camp Hill, and Howard Richard Peiffer, New Cumberland, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of application Ser. No. 695,123, Jan. 2, 1968. This application Apr. 23, 1970, Ser. No. 31,188
Int. Cl. C23b *5/52*
U.S. Cl. 204—37 R 4 Claims

Electrical contact device is fabricated by spraying fine particles of arc resistant material (e.g., WC) against surface of conductive metal (e.g., Au or Ag) in a manner

such that particles penetrate, and become embedded in, the conductive metal. Conductive metal against which particles are sprayed may be of button or solid conductive metal or may comprise coating or plating of conductive metal on contact device such as switch arm or electrical terminal.

3,697,390

ELECTRODEPOSITION OF METALLIC BORIDE COATINGS

Frank X. McCawley, Cheverly, Md., Charlie Wyche, Washington, D.C., and David Schlain, Greenbelt, Md., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,020
Int. Cl. C23b *5/00*
U.S. Cl. 204—39 **9 Claims**

Platings of titanium, zirconium and hafnium borides are produced on substrate materials by electrodeposition from a fused, borate-type bath.

3,697,391

ELECTROPLATING PROCESSES AND COMPOSITIONS

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., New York, N.Y.

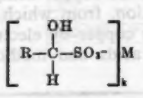
No Drawing. Filed July 17, 1970, Ser. No. 55,959
Int. Cl. C23b *5/08, 5/32, 5/46*
U.S. Cl. 204—43 **13 Claims**

In accordance with certain of its aspects, this invention relates to a process for the preparation of an electrodeposit which contains at least one metal selected from the group consisting of nickel and cobalt which comprises passing current from an anode to a cathode through an aqueous plating solution containing a member selected from the group consisting of cobalt compounds and nickel compounds providing cobalt or nickel ions for electrodepositing cobalt or nickel and containing in combination an effective amount of:

(1) At least one member selected from the group of cooperating additives consisting of:

(a) primary brightener
(b) secondary brightener
(c) secondary auxiliary brightener
(d) anti-pitting agent; and

(2) An organic hydroxy-sulfonate compound of the formula:



wherein M is a cation having a valence of 1–2; *k* is an integer 1–2 corresponding to the valence of M; and R is hydrogen or a monovalent aliphatic group of 1–16 carbon atoms; for a time period sufficient to form a sound metal electroplate upon said cathode surface.

3,697,392

ELECTRODEPOSITION OF NICKEL

Joseph R. Duchene, Southfield, Mich., assignor to Allied Research Products, Inc., Baltimore, Md.

No Drawing. Filed July 2, 1970, Ser. No. 52,083
Int. Cl. C23b *5/08*
U.S. Cl. 204—49 **4 Claims**

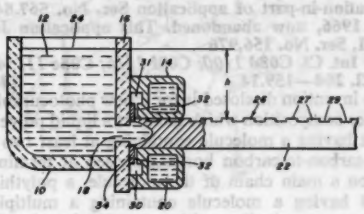
An aqueous acidic bath solution for electroplating nickel includes at least one nickel salt as a source of nickel and, as a brightener, a combination of a sulfolene compound and a water-soluble allyl sulfonate in an amount sufficient to produce a bright nickel electrodeposit.

3,697,393

ANODIZED CONTINUOUSLY CAST DECORATIVE PLATE WITH TEXTURED SURFACE

Clement Roger Howle, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 27, 1970, Ser. No. 23,205
Int. Cl. C23b *9/02*
U.S. Cl. 204—58 **2 Claims**



Decorative plate or sheet having an attractive textured surface is continuously cast in an open ended chilled mold. The freezing plate ingot has a surface solidified in a varying and cyclic fashion by applying thereto a volatile lubricant at a rate much higher than that normally employed in similar casting arrangements. The resulting plate exhibits a textured surface with accompanying variations in composition and metallurgical structure such that the response to electrolytic anodizing treatments varies and the anodized surface exhibits varying shades and colors.

3,697,394

SYNTHESIS OF OXYCHLORINE TRIFLUORIDE

Donald Pilipovich and Richard D. Wilson, Canoga Park, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Apr. 3, 1968, Ser. No. 720,434
Int. Cl. C01b *11/02, 11/24*
U.S. Cl. 204—157.1 R **5 Claims**

A synthesis of ClF_3O comprising reacting under ultraviolet radiation oxygen and either chlorine and fluorine or a compound consisting of chlorine and fluorine.

3,697,395

PHOTOCURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Division of application Ser. No. 44,607, June 8, 1970, now Patent No. 3,661,744, which is a continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, now abandoned, which in turn is a continuation-in-part of application Ser. No. 567,841, July 26, 1966, now abandoned. This application June 25, 1971, Ser. No. 156,931
Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*
U.S. Cl. 204—159.14 **17 Claims**

The invention disclosed is for a new photocurable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain of the molecule, a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule, and a photocuring rate accelerator. The photocurable liquid polymer composition upon curing in the presence of actinic light forms odorless, solid, elastomeric or resinous products which may serve as sealants, coatings, adhesives and molded articles.

3,697,396

PHOTOCURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Division of application Ser. No. 44,607, June 8, 1970, now Patent No. 3,661,744, which is a continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, now abandoned, which in turn is a continuation-in-part of application Ser. No. 567,841, July 26, 1966, now abandoned. This application June 25, 1971, Ser. No. 156,976

Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*

U.S. Cl. 204—159.14 17 Claims

The invention disclosed is for a new photocurable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain of the molecule, a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule, and a photocuring rate accelerator. The photocurable liquid polymer composition upon curing in the presence of actinic light forms odorless, solid, elastomeric or resinous products which may serve as sealants, coatings, adhesives and molded articles.

3,697,397

HIGH ENERGY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Division of application Ser. No. 49,191, June 23, 1970, which is a continuation-in-part of application Ser. No. 617,801, Feb. 23, 1967, now abandoned, which in turn is a continuation-in-part of application Ser. No. 567,841, July 26, 1966, now abandoned. This application June 25, 1971, Ser. No. 157,038

Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*

U.S. Cl. 204—159.14 17 Claims

The invention disclosed is for a new high energy curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The high energy curable liquid polymer composition upon curing in the presence of high energy irradiation forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,697,398

PROCESS FOR ELECTROLYTICALLY APPLYING POLYMER COATINGS ON ELECTROCONDUCTIVE ARTICLES

Ritchie A. Wessling and William J. Settineri, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation of abandoned application Ser. No. 879,510, Nov. 24, 1969. This application July 6, 1971, Ser. No. 160,222

Int. Cl. C23b *5/00*; B01k *5/00, 1/00*

U.S. Cl. 204—14 N 9 Claims

Hydrophobic polymer coatings are applied to solid electroconductive articles by subjecting a polysulfonium salt in solution in an electrolysis solvent to an electrical potential sufficient to reduce the sulfonium salt. The solid electroconductive articles are used as the cathode in the electrolysis process. In example, a lead electrode is coated with poly(p-xylylene) by electrolyzing an aqueous solution of (p-phenylenedimethylene)bis(dimethylsulfonium chloride).

3,697,399

METHOD OF CONTINUOUSLY PLATING A STEEL STRAP ON ONE SURFACE

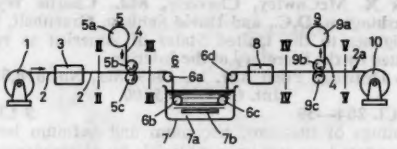
Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Sunto-gun, Shizuoka Prefecture, Japan

Filed June 3, 1971, Ser. No. 149,655

Claims priority, application Japan, July 11, 1970, 45/60,795

Int. Cl. C23b *5/48, 5/58, 1/02*

U.S. Cl. 204—15 6 Claims



This invention relates to a novel one-surface continuously electroplating method for continuously applying an electroplating film to one surface of a comparatively thin steel strap.

3,697,400

RECOVERING METALS BY EXTRACTION WITH A QUINALDINIC ACID AND ELECTROWINNING FROM THE STRIPPED CHELATE

Michael Pang, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 17, 1971, Ser. No. 116,065

Int. Cl. C22d *1/16*; C22b *3/00, 15/00*

U.S. Cl. 204—106 5 Claims

Copper is recovered from ores, or slags, or tailing piles, in which the cupriferous material is finally subdivided by leaching with a dilute aqueous acidic leach solution, the leach solution separated from insolubles, and the copper extracted using as extractant an alkyl-3-methylquinaldinic acid, the alkyl group being from 6 to 25 carbon atoms, such as 6-dodecyl-3-methylquinaldinic acid, in an organic solvent system, such as 75/25 kerosene/aromatic petroleum fraction and which may contain up to 25% of a C_9 to C_{14} alkanol, the organic extractant in solution separated from the aqueous leach solution, and the copper stripped from the organic extractant by strong sulfuric acid, the copper being stripped as copper sulfate in acid solution, from which copper is recovered as electrolytic grade copper by electrolysis.

New quinaldinic acids and methods of synthesis are disclosed.

3,697,401

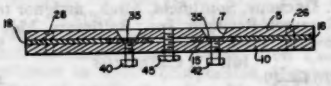
ELECTROCHEMICAL MILLING PROCESS

Joseph G. Lucas, Trumbull, and John Zuryk, Fairfield, Conn., assignors to Avco Corporation, Stratford, Conn.

Continuation-in-part of abandoned application Ser. No. 638,298, May 15, 1967. This application Jan. 9, 1970, Ser. No. 1,830

Int. Cl. B23p *1/00*

U.S. Cl. 204—143 R 9 Claims



A process and apparatus for the selective removal of metal from a corrosion resistant metal piece by electrochemical milling by covering the piece with an aluminum

or titanium electrically conductive mask which is provided with a protective surface through anodization during the process, the non-masked, etched surfaces of the metal piece being electrochemically dissolved to a predetermined depth.

3,697,402

PHOTOCURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Application June 23, 1970, Ser. No. 44,607, now Patent No. 3,661,774, dated May 9, 1972, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 156,969

Int. Cl. C08c *11/54*; C08d *1/00*; C08f *1/16*

U.S. Cl. 204—159.14 **17 Claims**

The invention disclosed is for a new photocurable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain of the molecule, a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule, and a photocuring rate accelerator. The photocurable liquid polymer composition upon curing in the presence of actinic light forms odorless, solid, elastomeric or resinous products which may serve as sealants, coatings, adhesives and molded articles.

3,697,403

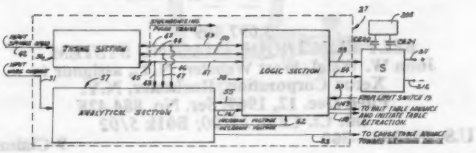
ELECTROCHEMICAL GRINDING APPARATUS

Lester V. Colwell, Ann Arbor, Mich., assignor to Hammond Machinery Builders Inc., Kalamazoo, Mich.

Filed Nov. 7, 1968, Ser. No. 774,009

Int. Cl. B23p *1/02*

U.S. Cl. 204—218 **17 Claims**



A process and apparatus for automatically searching for, establishing and maintaining one or more selected performance parameters in an electrochemical grinding operation.

3,697,404

APPARATUS TO SUPPORT THE ELECTRODES AND BUS BARS IN AN ELECTROLYTIC CELL

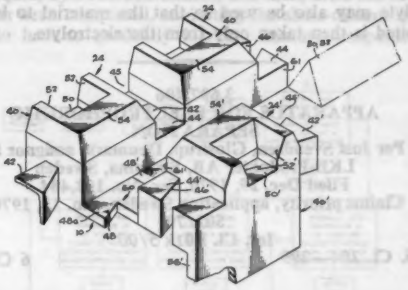
Peter M. Paige, 1200 N. Flores, Los Angeles, Calif. 90069

Filed Jan. 29, 1971, Ser. No. 110,943

Int. Cl. C23b *5/70*

U.S. Cl. 204—267 **14 Claims**

Electrolytic cell apparatus comprising as an essential feature a capping board formed of a plurality of interlocking, e.g., plastic molded, units forming a structure designed to be supported on the walls of electrolytic tanks, and to support a series of anodes, cathodes and bus bars in operable relation, each of such units including a body portion with a seat and extending dovetail members which interlock adjacent units. Anode and cathode hanger bars rest at one end on the seats of the capping board and are supported at their opposite ends on a bus bar between aligned interlocking units of the capping board.



3,697,405

APPARATUS FOR PARTIAL ELECTROPLATING INCLUDING AN ELECTROPLATING HEAD

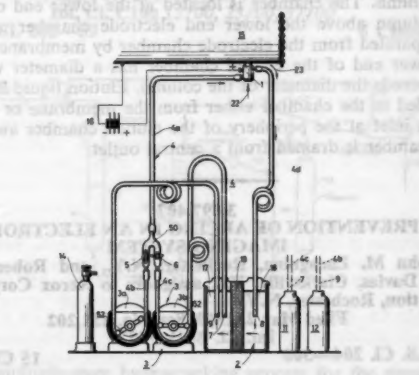
Karl Butter, Munich, and Willibald Wittich, Ottobrunn, Germany, assignors to Messerschmitt Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Nov. 3, 1969, Ser. No. 873,376

Claims priority, application Germany, Nov. 7, 1968, P 18 07 481.2

Int. Cl. B01k *3/00*

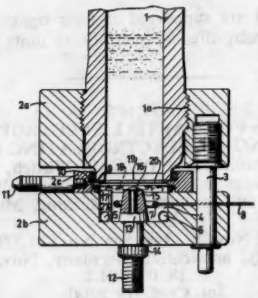
U.S. Cl. 204—275 **6 Claims**



A process for partial electroplating using a plating head carrying the anode and which is traversed by the electrolyte is characterized by the fact that it proceeds continuously with the exclusion of air or oxygen. The electrolyte is supplied from an electrolyte tank by means of a pump unit through a hose system to the plating head which is pressed against the article to be plated so that the article therefore acts as a cathode. The ends of the hose system for the head are immersed in tanks which may be filled for example, with cleaning liquid or an etchant and may be thereafter connected with gas tanks and the electrolyte as desired. The apparatus includes hose pumps comprising rotating members which cyclically operate upon a portion of the hoses connected to the electrolyte or the fluid for the purpose of directing the electrolyte or fluid from a tank source up to the electroplating head. The head is held against the article for example, a boiler which is to be electroplated with the interposition of a sealing material. Within the plating

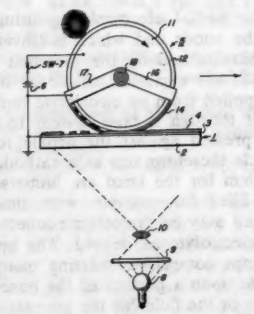
head the direction of flow of the electrolyte is opposed to that of the electrical current and the anode is located behind the cathode in respect to the flow direction, precious metal electrode which is insoluble in the electrolyte may also be used so that the material to be deposited is then taken only from the electrolyte.

3,697,406
APPARATUS FOR ELECTROPHORETIC SEPARATION
Per Just Svendsen, Glostrup, Denmark, assignor to LKB-Produkter AB, Bromma, Sweden
Filed Dec. 29, 1970, Ser. No. 102,484
Claims priority, application Sweden, Jan. 15, 1970, 502/70
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **6 Claims**



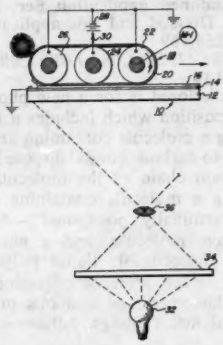
An elution chamber for an electrophoretic separation column. The chamber is located at the lower end of the column above the lower end electrode chamber and is separated from the electrode chamber by membrane. The lower end of the elution chamber has a diameter which exceeds the diameter of the column. Elution liquid is supplied to the chamber either from the membrane or from an inlet at the periphery of the elution chamber and the chamber is drained from a central outlet.

3,697,407
PREVENTION OF ARCING IN AN ELECTRODE IMAGING SYSTEM
John M. Lacagnina, Rochester, N.Y., and Robert G. Davies, Clarksville, Va., assignors to Xerox Corporation, Rochester, N.Y.
Filed May 2, 1969, Ser. No. 821,202
Int. Cl. B01k *5/02*
U.S. Cl. 204—300 **15 Claims**



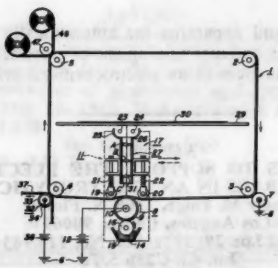
Method and apparatus for eliminating corona arcing between electrodes in an electrophoretic imaging system by introducing a member at the entrance and exit of the nip between adjacent electrodes during the application of an electric field for imaging of an electrophoretic suspension between the electrodes.

3,697,408
IMAGING SYSTEM
Gerard T. Severynse, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed May 2, 1969, Ser. No. 821,255
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—300 **2 Claims**



Method and apparatus for eliminating corona arcing during imaging of an electrophoretic imaging system having an elongated blocking electrode and an injecting electrode contacting each other during imaging to form a contact zone and applying a field confined within the area of the contact zone.

3,697,409
BELT ELECTRODE IMAGING SYSTEM
John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,428
Int. Cl. C23b *13/00*; B01k *5/02*
U.S. Cl. 204—300 **9 Claims**

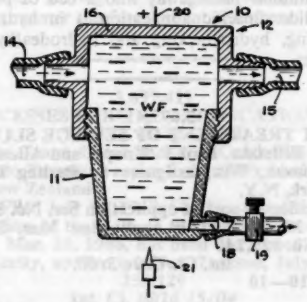


A flexible transparent belt electrode is formed into a loop with a roller electrode positioned against the loop on its outside surface. Platens are positioned inside the loop and light is projected through the belt to photoelectrophoretic ink between the belt and roller electrodes.

3,697,410
ELECTRODIALYSIS DEMINERALIZATION APPARATUS
Allan M. Johnson, Reseda, and Richard F. Gilman, Simi, Calif., assignors to CCI Aerospace Corporation, Van Nuys, Calif.
Filed Feb. 8, 1971, Ser. No. 113,509
Int. Cl. B01d *13/02*; C02b *1/82*
U.S. Cl. 204—301 9 Claims

An apparatus to effect demineralization of water by the process of electrodialysis wherein an ion exchange membrane and a salt storage element are located in a cross sectional spiral configuration, the water to be demineralized by passing through the apparatus also in a cross sectional spiral configuration.

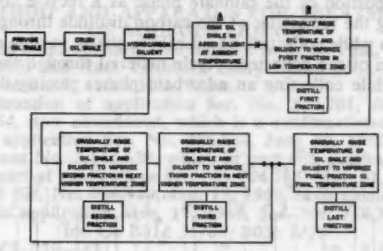
3,697,411
ELECTROSTATIC FUEL FILTER
Oscar C. Blomgren, Jr., Lake Bluff, Ill., assignor to Inter-Probe, Inc., Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 97,626
Int. Cl. B01d *13/02*; B03c *5/00*
U.S. Cl. 204—302 5 Claims



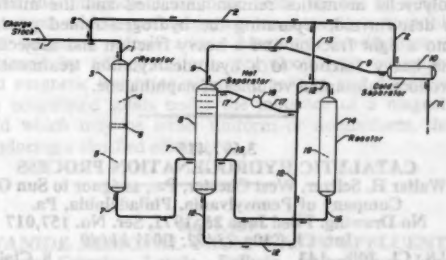
A device for separating or filtering water from fuel including a container or vessel into which is received an emulsion or mixture of water and fuel, wherein the container includes a body of electrically insulating material and a cover member of electrically conductive material, and wherein the cover is connected to ground potential, and an electrode or probe to which is supplied a high voltage direct current potential arranged adjacent to or in engagement with the body of insulation material at a point generally opposite the position of the cover member.

3,697,412
METHOD OF PROCESSING OIL SHALE
Ray S. Brimhall, deceased, late of Salt Lake City, Utah, by Walker Bank and Trust Co., administrator, P.O. Box 1169, Salt Lake City, Utah 84110
Filed Feb. 16, 1970, Ser. No. 11,727
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 6 Claims

The present invention comprises a method of economically processing oil shale at low temperatures and pressures in such a manner that the effective yield of end products from kerogen in the shale is measurably increased, and at reduced cost, over that possible by the employment of conventional methods. In the present invention, the process employs the twin steps of, first, soaking crushed oil shale in a liquid, hydrocarbon diluent, and then, after the soaking has been completed, subjecting the shale-diluent mixture to heat to gradually increase mixture temperature from ambient condition, so as to enable maximum recovery ultimately, of distillates. The dual functions of, first, soaking the oil shale in a diluent under ambient temperature conditions and, secondly, gradually and progressively increasing the temperature of the shale, has been found to increase measurably the yield of products vaporized from the kerogen of the shale.



3,697,413
SIMULTANEOUS PRODUCTION OF GASOLINE AND LPG
Robert J. J. Hamblin, Deerfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 5, 1971, Ser. No. 113,002
Int. Cl. C10g *13/00, 23/00, 37/00*
U.S. Cl. 208—59 6 Claims

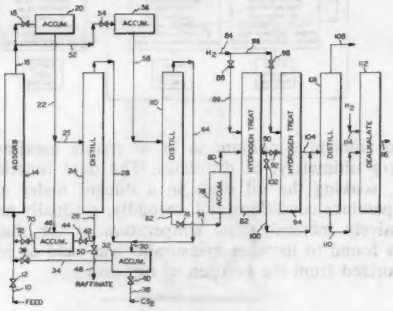


A multiple-stage hydrocracking process for the simultaneous production of gasoline and LPG (liquefied petroleum gas). A first stage functions to produce from about 40.0% to about 90.0% of the desired quantity of gasoline. Heavier material is processed in the second stage at LPG-producing conditions. The hydrocracked effluent from both stages is introduced into a common separation zone from which the gasoline and LPG are recovered, and from which the heavier material is withdrawn and introduced into the second stage.

3,697,414
METHOD FOR PRODUCING NAPHTHALENE
David B. Carpenter, Hackettstown, N.J., and Edward A. Thompson, Louisa, Ky., assignors to Ashland Oil, Inc., Columbus, Ohio
Filed Apr. 5, 1971, Ser. No. 131,053
Int. Cl. C07c *7/12*
U.S. Cl. 208—85 18 Claims

Hydrocarbon mixtures, such as light cycle oils from a catalytic cracking unit, are selectively separated by a

cyclic adsorption technique involving passing the hydrocarbon mixture through a fixed bed of activated carbon to adsorb selectively polycyclic aromatic components as an adsorbate phase while collecting less readily adsorbed components as a raffinate phase; passing a first portion of a predetermined volume of carbon disulfide through the carbon to displace the adsorbate phase while collecting a portion of the raffinate phase as a recycle stream; passing the remainder of the carbon disulfide through the carbon while collecting an adsorbate phase; passing a first portion of the collected recycle material through the carbon while collecting an adsorbate phase; passing the remainder of the collected recycle material through the carbon while collecting a raffinate phase; separating carbon disulfide from the raffinate and adsorbate phase for reuse as a displacing fluid; passing the adsorbate to at least one hydrogen treating operation under conditions such that residual aliphatic hydrocarbons are cracked, residual alkyl monocyclic hydrocarbons are dealkylated, polycyclic aromatics remain unreacted and the mixture is desulfurized, separating the hydrogen-treated product into a light fraction and a heavy fraction and subjecting the heavy fraction to a hydrodealkylation treatment to produce substantial volumes of naphthalene.



3,697,415

CATALYTIC HYDROGENATION PROCESS

Walter H. Seitzer, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

No Drawing. Filed June 25, 1971, Ser. No. 157,017

Int. Cl. C10g *23/02*; B01j *11/40*

U.S. Cl. 208—143 **8 Claims**

A hydrogenation process for mineral oil by contacting said oil with hydrogen in the presence of a catalyst consisting essentially of a Y-type zeolite molecular sieve containing tin promoted with manganese, vanadium, or zinc. The invention also embodies the catalyst composition used in the process.

3,697,416

FLUID CONTACTING METHOD FOR FLUID-SOLID CONTACTING CHAMBERS

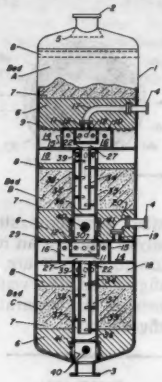
Don B. Carson and William R. Hennemuth, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 835,679, June 23, 1969. This application Mar. 8, 1971, Ser. No. 121,668

Int. Cl. C10g *11/10*

U.S. Cl. 208—146 **10 Claims**

Method for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is passed into a central chamber having a plurality of fluid openings in the chamber wall, while a second fluid is passed into an annular chamber encompassing the central chamber and spaced apart therefrom. The second fluid is discharged via fluid openings in the inner annular chamber wall, into an annular space between the chambers, and the first fluid is discharged from the central chamber into the second fluid discharge. A resulting fluid mixture is passed from the annular space into a first conduit means confined within a second conduit means in a first direction of flow. The mixture is then passed into an annular passageway confined between the first and second conduit means in a second direction of flow substantially countercurrent to the first direction of flow. The mixture is then passed from the annular passageway into a bed of particulated contact solids. Specific application is in hydrogenation, hydrotreating, hydrocracking and hydrodealkylation reaction zones.



3,697,417

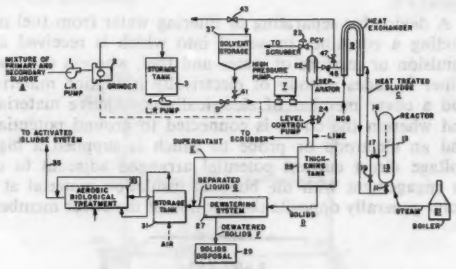
HEAT TREATMENT OF SEWAGE SLUDGE

Gerald H. Telletzke, Paul V. Knopp, and Allen H. Erickson, Wausau, Wis., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 861,894, Sept. 29, 1969. This application Mar. 2, 1971, Ser. No. 120,246

Int. Cl. C02c *3/00*

U.S. Cl. 210—10 **10 Claims**



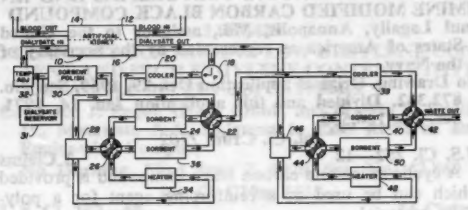
Sewage sludge is briefly heated in a continuous process to a temperature between 190° C. and about 230° C. for a period of time, up to about 240 seconds, which is inversely proportional to the temperature to which the sludge is heated and which is just sufficient to substantially improve the dewatering characteristics of the sludge, and immediately thereafter cooled thereby reducing color and BOD (biological oxygen demand) formation in the supernatant liquid.

3,697,418

METHOD AND APPARATUS FOR REGENERATING THE DIALYZING FLUID FOR AN ARTIFICIAL KIDNEY

Allan M. Johnson, Reseda, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Jan. 25, 1971, Ser. No. 109,234
Int. Cl. B01d *13/00*
U.S. Cl. 210—22 22 Claims



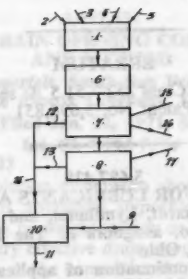
The method and apparatus for removing the waste metabolites from the dialyzing fluid of an artificial kidney wherein the temperature of the dialyzing fluid is lowered prior to the fluid entering a first carbon sorbent chamber, the carbon absorbing the waste metabolites, a portion of the fluid leaving the first chamber being raised in temperature and moved into a second carbon sorbent chamber having a high percentage of adsorbed waste metabolites, the fluid after leaving the second sorbent chamber being lowered in temperature and caused to come into contact with a third sorbent chamber, a portion of the fluid after leaving the third sorbent chamber being returned to reenter the first sorbent chamber.

3,697,419

PROCESSES FOR THE PURIFICATION OF WASTE EFFLUENT

Roy Arthur Grant, Great Shelford, Cambridge, England, assignor to Tasman Vaccine Laboratory Limited, Upper Hutt, New Zealand

Filed July 14, 1969, Ser. No. 841,430
The portion of the term of the patent subsequent to Mar. 30, 1988, has been disclaimed
Claims priority, application New Zealand, July 15, 1968, 153,129
Int. Cl. B01d *15/04*
U.S. Cl. 210—27 2 Claims



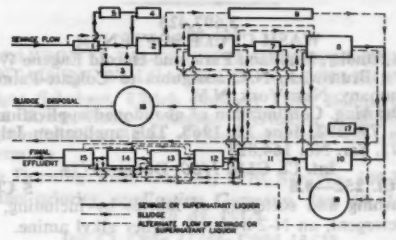
The specification describes the use of a particulate ion exchange material for the purification of waste effluents, such as washings obtained from slaughter houses, which contain protein or fat, or both. The use of the material can provide effluent with a sufficiently low contamination level for it to be readily disposed of, or even reused for further cleaning purposes. By suitable elution of the material, the protein or fat can be released and isolated for use, for example, as animal food. The ion exchange material can be regenerated for reuse.

3,697,420

METHOD AND APPARATUS FOR TREATMENT OF AQUEOUS LIQUOR

Donald Stapf Blaisdell, 780 Summit Ave., St. Paul, Minn. 55105, and Ruth Elizabeth Barry Klaas, 3531 Ridgewood Road, Arden Hills, Minn.

Continuation of application Ser. No. 373,701, June 9, 1964, now abandoned, which is a continuation-in-part of application Ser. No. 206,184, June 29, 1962, now Patent No. 3,142,638, which in turn is a continuation-in-part of applications Ser. No. 724,785, Mar. 31, 1958, and Ser. No. 786,906, Jan. 15, 1959, both abandoned. This application Mar. 19, 1968, Ser. No. 714,362
Int. Cl. B01d *35/06;* B03c *1/10*
U.S. Cl. 210—42 8 Claims



Sewage treatment methods and apparatus are disclosed including those relating to catalytic oxidation, digestion under the influence of magnetic fields, the use of weighting agents which, preferably, are magnetically susceptible, and magnetic densification. Magnetic densification is achieved by adding cationic polyelectrolytic coagulants and magnetic weighting agents to sewage and densifying the coagulated solids under the influence of a magnetic field which may be either uniform or nonuniform, thus producing a clarified effluent.

3,697,421

CYANIDE REMOVAL FROM WASTE EFFLUENTS

Andrew Carmine Lauria, Ballwin, and Jeffrey Lynn Owens, Florissant, Mo., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,475
Int. Cl. C02b *1/18*
U.S. Cl. 210—59 8 Claims

Undesirable cyanide compounds in waste effluents can be converted to non-toxic biodegradable materials by treating such waste effluents with a starch conversion syrup. Preferably the waste effluent is also treated with a metal chelating composition when such effluent contains heavy metal cyanides.

3,697,422

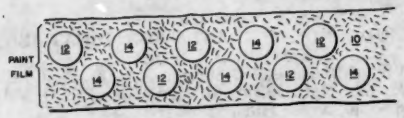
INTUMESCENT FILLERS FOR PAINTS

William L. Mackie, Ventura, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 23, 1970, Ser. No. 92,185
Int. Cl. C09d *5/18;* C09k *3/28*
U.S. Cl. 252—8.1 3 Claims

A conventional anti-corrosion paint composition containing a mixture of microspheres some of which contain

a foamable plastic material while others contain a spumific material. In the event that a surface coated with this formulation is exposed to heat, the microspheres will melt



causing an intermingling of their contents which will produce gas. Such gas causes the other liquids released by the ruptured microspheres to swell and foam creating a nonflammable insulative barrier.

3,697,423

WASH CYCLE SOFTENER

Bjorn Sundby, Highland Park, and Harold Eugene Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 736,292, June 12, 1968. This application July 21, 1971, Ser. No. 164,827

Int. Cl. C11d *1/00;* **D06m** *13/34*

U.S. Cl. 252—8.8 **5 Claims**

Washing and softening of fabrics by including, with the detergent, an N-2-hydroxy higher alkyl amine.

3,697,424

SOLUBLE OIL COMPOSITION

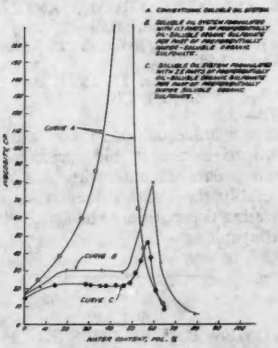
Le Roy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 713,496, Mar. 15, 1968, now Patent No. 3,500,919. This application Dec. 31, 1969, Ser. No. 889,640

The portion of the term of the patent subsequent to June 27, 1989, has been disclaimed

Int. Cl. C09k *3/00;* **E21b** *13/22*

U.S. Cl. 252—8.55 D **26 Claims**



A soluble oil composition comprising a liquid hydrocarbon, a preferentially oil-soluble organic sulfonate, a preferentially water-soluble organic sulfonate, and a stabilizing agent is disclosed. The composition has particular utility as a displacement fluid in a flooding process for the recovery of oil. The soluble oil composition can be substantially anhydrous, or it can contain water present as a water-in-oil microemulsion.

3,697,425

BEARINGS COMPRISING POLYOLEFINS AND AN IMINE MODIFIED CARBON BLACK COMPOUND

Paul Lagally, Annapolis, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Original application Oct. 29, 1969, Ser. No. 872,382. Divided and this application Jan. 14, 1971, Ser. No. 106,530

Int. Cl. C10m *7/02*

U.S. Cl. 252—12 **3 Claims**

A cyclic imine and carbon black compound is provided which can be used as a reinforcing agent for a polyolefin material.

3,697,426

AMINES AS ANTIWEAR ADDITIVES IN MARINE CYLINDER OILS

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 807,087, Mar. 13, 1969. This application Apr. 15, 1971, Ser. No. 134,437

Int. Cl. C10m *1/32, 1/54*

U.S. Cl. 252—42.7 **4 Claims**

Combinations of overbased calcium phenates and relatively high molecular weight aliphatic hydrocarbon substituted alkylene polyamines are used in lubricating oils, particularly marine lubricating oils, to reduce wear and provide acid neutralization capacity.

3,697,427

LUBRICANTS HAVING IMPROVED ANTI-WEAR AND ANTI-CORROSION PROPERTIES

Derek Clark Byford, Staines, and Howard Bernard Silver, Hinchley Wood, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 653,681, July 17, 1967. This application Apr. 30, 1971, Ser. No. 139,182

Int. Cl. C10m *1/34, 1/46*

U.S. Cl. 252—49.9 **7 Claims**

A lubricant, especially for supersonic jet aircraft engines, is based on a hindered ester and contains a dialkyl hydrogen phosphate as a load-carrying additive, a copper passivator and an aromatic amine antioxidant. The lubricant may also contain a lead corrosion inhibitor and a neutral phosphate.

ERRATUM

For Class 252—51.5 A; see:
Patent No. 3,696,851

3,697,428

ADDITIVES FOR LUBRICANTS AND FUELS

Norman A. Meinhardt, Lyndhurst, and Robert Widmer, Painesville, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation of application Ser. No. 162,704, July 14, 1971, which is a continuation of application Ser. No. 812,405, Apr. 1, 1969, both abandoned. This application Nov. 1, 1971, Ser. No. 194,566

Int. Cl. C10m *1/26*

U.S. Cl. 252—56 D **16 Claims**

Oil-soluble compositions produced by reacting polycarboxylic acid acylating agents having at least fifty aliphatic

carbon atoms with a di- or trihydric alcohol and a polyhydric alcohol having at least four hydroxyl groups are useful as ashless dispersants in lubricants and fuels. Polyolefin-substituted succinic anhydride simultaneously treated with a mixture of trismethylolpropane and pentaerythritol produces such an oil-soluble composition.

3,697,429

LUBRICANT CONTAINING LOW ETHYLENE CONTENT AND HIGH ETHYLENE CONTENT ETHYLENE-ALPHA-OLEFIN COPOLYMERS

Lawrence J. Engel, Green Brook, and Marvin F. Smith, Jr., Matawan, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed June 2, 1970, Ser. No. 42,869

Int. Cl. C10m *1/18*

U.S. Cl. 252—59 **11 Claims**

A lubricating oil composition comprising a lubricating oil and a viscosity index improving amount of an oil-soluble polymer composition comprising a first copolymer of ethylene and a C_3 to C_{18} higher alpha-olefin having an ethylene content of 50–95 mole percent (40–83 wt. percent), and a second copolymer of ethylene and a C_3 to C_{18} higher alpha-olefin having an ethylene content of 5–80 mole percent (3–70 wt. percent), the ethylene content of the first copolymer being at least 5 mole percent (4 wt. percent) more than the ethylene content of the second polymer.

3,697,430

PIEZOELECTRIC MATERIALS

Noboru Ichinose, Harutoshi Egami, Katsunori Yokoyama, and Yohachi Yamashita, Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 3, 1971, Ser. No. 149,613

Claims priority, application Japan, June 13, 1970, 45/50,719

Int. Cl. C04b *35/46*

U.S. Cl. 252—62.9 **1 Claim**

Piezoelectric materials having a composition which may be expressed by the general formula:

$$(1-x)PbTiO_3 \cdot xPb(Me_{1/2}Te_{1/2})O_3$$

(where Me represents at least one metal selected from the group consisting of Mg and Zn and x denotes a value of 0.02 to 0.25).

3,697,431

LIQUID DRAIN OPENING COMPOSITION AND METHOD

Vernon E. Summerfelt, South San Francisco, Calif., assignor to The Clorox Company, Oakland, Calif.

No Drawing. Filed Jan. 22, 1971, Ser. No. 109,057

Int. Cl. C11d *7/54*

U.S. Cl. 252—103 **2 Claims**

An aqueous solution of between about 1% and 9% by weight sodium or potassium hypochlorite and between about 2% and 9% by weight sodium or potassium hydroxide provides a very effective drain opener which is not as hazardous to use as the conventional highly concentrated caustic drain openers. Between about 1% and 7% by weight sodium or potassium chloride is present in the solution, and the potassium ion concentration in the drain opener solution is in excess of the sodium ion concentration. Sodium or potassium silicate may be included in the drain opener solution to inhibit the corrosive action of the solution upon metal plumbing fixtures, and a small amount of a wetting agent, or in other words surface active agent, increases the rate at which the drain opener solution penetrates fatty material.

3,697,432

CHEMILUMINESCENT REACTION OF CHLORINATED GLYCOLIDE WITH HYDROGEN PEROXIDE IN THE PRESENCE OF A FLUORESCER

Donald Roy Maulding, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 17, 1969, Ser. No. 886,045

Int. Cl. C09k *3/00*

U.S. Cl. 252—188 **4 Claims**

Novel glycolide compounds which obtain chemiluminescent light when reacted with other necessary chemiluminescent reactants in the direct generation of light from chemical energy. By "light" as referred to herein is meant electromagnetic radiation at wavelengths falling between about 350 mμ and about 1000 mμ.

3,697,433

S,S'-CARBONYL-BIS-DIALKYLDITHIOPHOSPHATE CONTAINING VULCANIZATION ACCELERATOR

Rudiger Schubart, Ulrich Eholzer, Theo Kempermann, and Ernst Roos, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,361

Claims priority, application Germany, Jan. 13, 1970, P 20 01 151.2

Int. Cl. C08c *11/66*; C08d *13/28*

U.S. Cl. 252—182 **7 Claims**

Vulcanization accelerators based on S,S'-carbonyl-bis-dialkyldithiophosphates and a thiazole accelerator with the optional inclusion of thiuramic or dithiocarbamate accelerators and/or thiourea, process of vulcanizing terpolymers of ethylene and propylene, i.e., EPDM rubbers, and resulting product.

3,697,434

CHEMILUMINESCENT SPRAY FORMULATION

Sydney Shefler, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 5, 1965, Ser. No. 493,284

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 **5 Claims**

1. An oxyluminescent spray formulation comprising a mixture of

a chemiluminescent compound,

a liquefied gas and

a flocking material;

said chemiluminescent compound being a member selected from the group consisting of tetrakis(dimethylamino)ethylene, tetrakis(N - pyrrolidinyl)ethylene, 1,1',3,3' - tetramethyl - $\Delta^{2,2'}$ - bi(imidazolidine), 1,1',3,3'-tetraethyl - $\Delta^{2,2'}$ - bi(imidazolidine), 1,1'-diethyl-3,3'-dimethyl - $\Delta^{2,2'}$ - bi(imidazolidine) and tetrakis-(dimethylamino-methyleneamino)ethylene;

said liquefied gas being a member selected from the group consisting of butane, ethane, propane, carbon dioxide, nitrogen, nitrous oxide, dimethylether, dichlorodifluoromethane, trichlorofluoromethane, chlorodifluoromethane, chlorotrifluoromethane, 1,1,2-trichloro - 1,2,2-trifluoroethane, dichlorotetrafluoroethane, octafluorocyclobutane, hexafluoroethane, tetrafluoromethane and mixtures thereof, and

said material being a member selected from the group consisting of cotton, nylon, Dacron, polypropylene and polyethylene.

3,697,435

URANIUM DIOXIDE-YTTRIUM OXIDE-ZIRCONIUM DIOXIDE MICROSPHERES

Jean G. Smith, Baltimore, Md., and Frederick T. Fitch, Shaker Heights, Ohio, assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 495,352, Oct. 17, 1965. This application Mar. 16, 1967, Ser. No. 623,554

Int. Cl. C09k *3/00*; G21c *19/42*

U.S. Cl. 252—301.1 1 Claim

Microspheres containing 30–55% uranium dioxide, 10–45% yttrium oxide, and 15–55% zirconium dioxide.

3,697,436

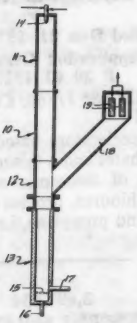
PRODUCTION OF URANIUM AND PLUTONIUM CARBIDES AND NITRIDES

Eugene A. Coppinger, Richland, and Benjamin M. Johnson, Kennewick, Wash., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 26, 1969, Ser. No. 880,067

Int. Cl. C09k *3/02*

U.S. Cl. 252—301.1 R 3 Claims



Sugar is dissolved in an aqueous solution of an actinide nitrate, such as uranium and/or plutonium nitrate, and the resulting solution is subjected to radiant-heat spray calcination, producing a calcined mixture of carbon with actinide oxide. This intimately mixed, highly reactive mixture is then heated at a high temperature in the presence of nitrogen to produce actinide nitride or, in the presence of an inert gas, to produce the corresponding carbide.

3,697,437

ENCAPSULATION PROCESS BY COMPLEX COACERVATION USING INORGANIC POLYPHOSPHATES AND ORGANIC HYDROPHILIC POLYMERIC MATERIAL

Mark V. Fogle, Lewisburg, Ohio, and Georg Hörger, Steppach, Germany, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed May 27, 1970, Ser. No. 41,109

Int. Cl. A61k *9/04*; B01j *13/02*; B44d *1/02*

U.S. Cl. 252—316 5 Claims

A process is disclosed for manufacturing capsules, en masse, by use of a liquid-liquid phase separation which includes polyphosphate inorganic material as a complexing, phase-separation-inducing, polymer. The disclosed process is conducted in an aqueous capsule manufacturing vehicle and the material which emerges as a liquid phase is an aqueous solution of organic hydrophilic polymeric material and inorganic polyphosphate material. The liquid-liquid phase separation of this invention is the type generally named "complex" coacervation wherein the separated, emergent, liquid phase includes a major portion of both, the organic hydrophilic polymeric material and the phase - separation - inducing material—in this invention, polyphosphate polymeric material. The organic polymeric material and the inorganic polymeric material are complexed together by virtue of opposite electrical charges, the complex is at least partially immiscible with the manufacturing vehicle, and the manufacturing vehicle contains only a minor amount of either polymeric material. Preferred materials for use in practicing the present invention include gelatin as the organic hydrophilic polymeric material and polyphosphates as the inorganic polymeric phase-separation-inducing material.

3,697,438

FINE PAPER MILL DEFOAMER AND ITS USE

Hillel Lieberman, Andalusia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,062

Int. Cl. B01d *17/00*

U.S. Cl. 252—321 10 Claims

The present invention is directed to a method and composition for controlling foam in aqueous systems and in particular paper making systems. The method basically comprises adding to foam-prone areas of the systems a composition comprising a mineral oil, a mixture of polyethylene glycol esters, a polypropylene glycol and a fatty alcohol.

3,697,439

COMPOSITION FOR CONTROLLING FOAMING IN AQUEOUS SYSTEMS AND ITS METHOD OF USE

Hillel Lieberman, Andalusia, Carlos A. Duharte-Francia, Fort Washington, and John W. Henderson, Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed May 26, 1969, Ser. No. 827,943

Int. Cl. B01d

U.S. Cl. 252—321 14 Claims

This disclosure relates to defoaming compositions and their use in controlling foam in aqueous systems. The compositions which can be emulsive in character consist essentially of a combination of aluminum oxide particles, at least one alkali metal or alkaline earth metal hydroxide, at least one fatty acid containing from 6 to 24 and preferably 16 to 22 carbon atoms, and a water-insoluble liquid organic carrier. The composition may contain water, and where the liquid carrier is hydrophobic in character, the composition will be an emulsion. Moreover, in certain instances it is desirable to incorporate surface-active agents (surfactants) or spreading agents in the composition.

3,697,440

DEFOAMER COMPOSITIONS CONTAINING ORGANIC PARTICLES

Irwin A. Lichtman, Oradell, and Fred E. Woodward, Watchung, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed June 27, 1969, Ser. No. 837,297

Int. Cl. B01d *17/00*

U.S. Cl. 252—321 4 Claims

Defoamer compositions are prepared by using particular oil insoluble normally solid organic polymer particles, secondary organic polymers which may be oil soluble or oil insoluble and liquid hydrocarbons. Optionally, amides and silicone oils are present.

3,697,441
METHOD FOR PREPARING STABLE ACTINIDE PEROXIDE SOLS

George S. Petit and Charles A. Kienberger, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Dec. 8, 1970, Ser. No. 96,237
Int. Cl. B01d *17/04*
U.S. Cl. 252—301.1 S 11 Claims

A method for preparing stable actinide peroxide sols comprising precipitating the actinide as a peroxide from an acid solution at a pH of −0.5 to 1.5 and thereafter separating and suspending the actinide peroxide precipitate in water or a dilute hydrogen peroxide solution to form the actinide peroxide sol.

3,697,442
COMPOSITIONS FOR CONTROLLING FOAM IN AQUEOUS SYSTEMS AND ITS METHOD OF USE

Hillel Lieberman, Andalusia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed Aug. 13, 1970, Ser. No. 63,636
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 22 Claims

This disclosure relates to defoaming compositions and their use in controlling foam in aqueous systems. The compositions which can be emulsive in character contain a combination of a mixture of aluminum oxide particles and hydrophobic silica particles, at least one alkaline earth metal hydroxide, at least one fatty acid containing 6 to 24 and preferably 16 to 22 carbon atoms, and a water-insoluble liquid organic carrier. The composition may contain water, and where the liquid carrier is hydrophobic in character, the composition will be an emulsion. In certain instances it is desirable to incorporate surface-active agents (surfactants) or spreading agents in the composition.

3,697,443
ALUMINUM FLUORIDE FLUORINATION CATALYST

Kiyonori Shinoda, Tadayoshi Watanabe, and Shigeru Mizusawa, Fukushima, Japan, assignors to Kureha Kagaku Kogy Kabushiki Kaisha, Chuo-ku, Tokyo, Japan

Filed Aug. 12, 1969, Ser. No. 849,472
Claims priority, application Japan, Aug. 14, 1968, 43/57,888
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 1 Claim

A catalyst having higher activity in fluorination of acetylene and other hydrocarbons is obtained by treating an acidic active alumina containing 2 to 20% by weight of silica with hydrogen fluoride at a temperature of 200 to 430° C.

3,697,444
PREPARATION AND USE OF SILICA/ALUMINA-BASED HYDROCARBON CONVERSION CATALYST

Jakob van Klinken, Herman Wouter Kouwenhoven, and Pieter Aldert van Weeren, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Oct. 8, 1969, Ser. No. 864,707
Claims priority, application Netherlands, Oct. 11, 1968, 6814628
Int. Cl. B01j *11/36, 11/40*
U.S. Cl. 252—451 9 Claims

A silica/alumina based catalyst is prepared by neutralizing the xerogel with a nitrogen base, impregnating it with salts of Groups VII and Group VI–B metals in an alkaline solution, and subjecting it to a controlled calcination whereby temperature is increased stepwise in an oxygen-regulated atmosphere. The catalyst is useful in hydrocarbon-coversion processes. It is particularly useful in hydrodesulfurizing and hydrocracking residual oils containing asphaltenes, large amounts of sulfur and/or heavy metals.

3,697,445
HIGH SURFACE AREA NICKEL CATALYST

James L. Carter, Chatham, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 717,903, Apr. 1, 1968. This application Oct. 6, 1970, Ser. No. 78,601
Int. Cl. B01j *11/32, 11/34*
U.S. Cl. 252—452 12 Claims

A stabilized high surface area nickel catalyst which is particularly useful for removing trace quantities of oxygen from inert gases is described. The nickel-silica catalyst has a nickel surface area greater than 70 $m.^2/g.$ and a total surface area in the range of about 225 $m.^2/g.$ to about 300 $m.^2/g.$ The active catalyst contains from about 25 wt. percent to about 50 wt. percent nickel and of its total silica content 30 to 90 wt. percent is derived from precipitated silicate ions.

3,697,446
CATALYST COATING METHOD

David G. Braithwaite, Chicago, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Mar. 1, 1971, Ser. No. 120,040
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z 6 Claims

A method for bonding zeolites to substrate such as silica-alumina wherein water is used to fill the pores of the substrate prior to placing a thin coating of silica thereupon and subsequently placing a coating of zeolite on the silica coated substrate.

3,697,447
CATALYTIC OXIDATION UNIT COMPRISING A FLUID PERMEABLE BODY OF FIBROUS ADMIXTURE

Edward Robert Bettinardi, New York, N.Y., assignor to Johns-Manville Corporation, New York, N.Y.

No Drawing. Filed May 7, 1969, Ser. No. 822,732
Int. Cl. B01j *11/06, 11/08*
U.S. Cl. 252—458 15 Claims

A catalyst oxidation burner unit for the flameless combustion of gaseous carbonaceous fuel comprising a gas permeable, composite fiber porous body of an intimate admixture of asbestos fiber and ceramic type refractory fiber containing a deposited metal catalyst.

3,697,448
SELECTIVE ISOMERIZATION EMPLOYING METAL ARSENIDE CATALYST

Marvin M. Johnson, Donald C. Tabler, and Gerhard P. Nowack, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 6,971, Jan. 29, 1970. This application June 8, 1970, Ser. No. 44,665
Int. Cl. B01j *11/06, 11/22*
U.S. Cl. 252—464 2 Claims

A method and catalysts for selective hydrogenation and isomerization which involves contacting a feedstream with hydrogen and with various supported catalysts of metallic arsenides and antimonides, with carbon monoxide being optionally introduced into the reaction as a modifier.

3,697,449
ALKALI MODERATION OF SUPPORTED RUTHENIUM CATALYSTS
Loren D. Brake, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 691,991, Oct. 20, 1969, which is a continuation-in-part of abandoned application Ser. No. 516,084, Dec. 23, 1965. This application Dec. 14, 1970, Ser. No. 98,048
Int. Cl. B01j *11/08, 11/22*
U.S. Cl. 252—474 **9 Claims**

Supported ruthenium catalysts are moderated with an alkali metal hydroxide or alkoxide by mixing the supported catalyst and the alkali metal compound in the reaction medium of a hydrogenation process which may contain up to about 5% of water, at a temperature ranging from about 30° C. to about 300° C. The moderated catalyst is an effective hydrogenation catalyst for the hydrogenation of aromatic amines to the corresponding saturated cyclic amines.

3,697,450
PROCESS FOR PRODUCING RESISTANCE FILMS
Haruo Takenaka, Toshiaki Okiyama, and Nobuo Hiratsuka, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
No Drawing. Filed June 23, 1969, Ser. No. 835,774
Claims priority, application Japan, June 22, 1968, 43/43,299
Int. Cl. H01b *1/06*
U.S. Cl. 252—511 **10 Claims**

A resistance film and process therefor, including forming a dispersion of (1) a solution of an organic solvent-soluble plastic of a softening point greater than 80° C., (2) a conductive substance having a volume resistivity of less than $10^{-1}\Omega$ cm. and (3) an inorganic silicon-containing material of a volume resistivity of more than $10^{-4}\Omega$ cm., casting a film of the dispersion, and drying the film.

3,697,451
STABLE ENZYME CONTAINING LIQUID DETERGENT
Marvin L. Mausner, Teaneck, and Arnold Wiesenfeld, North Haledon, N.J., assignors to Witco Chemical Corporation, New York, N.Y.
No Drawing. Filed Jan. 2, 1969, Ser. No. 788,628
Int. Cl. C11d *1/83*
U.S. Cl. 252—545 **10 Claims**

Stable, liquid, concentrated detergent compositions containing (A) from about 0.001 to 5% by weight of active enzyme selected from the group consisting of proteolytic, amylolytic and lipolytic enzymes and mixtures of said enzymes; at least about 88% by weight of a polyfunctional essentially 100% active stable liquid detergent, particularly one composed of a combination of (i) an ethanolamine salt of alkyl benzene and/or alkyl toluene sulfonic acid, (ii) an ethoxylated or propoxylated ether of an aliphatic alcohol and/or of an alkyl phenol, and (iii) a fatty acid alkanolamide.

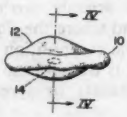
3,697,452
SHAMPOO
Frank Wesley Olson, Jr., Pompton Plains, and Karl Hutcheson Roberts, Flemington, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 558,266, June 17, 1966. This application May 19, 1969, Ser. No. 826,010
Int. Cl. A61k *7/08;* **C11d** *1/32, 1/825*
U.S. Cl. 252—545 **10 Claims**

A conditioning shampoo suitable for cleaning hair which has previously been treated with hairspray having a pH of 8.8 to 9.6 is disclosed which comprises an aqueous mixture of (a) a higher alkyl amine oxide surfactant, (b) a water-soluble, foaming amphoteric surfactant, and (c) a higher alkyl, quaternary ammonium salt surfactant, the total amount of said surfactants being about 12% to 30% by weight of the shampoo.

3,697,453
IMINODISUCCINIC ACID SALTS AS DETERGENT BUILDERS
Bryce E. Tate, Niantic, and Rudolph G. Berg, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.
No Drawing. Filed Mar. 8, 1971, Ser. No. 122,195
Int. Cl. C11d *3/26*
U.S. Cl. 252—546 **4 Claims**

The water-soluble salts of iminodisuccinic acid are used as detergent builders in cleansing and laundering compositions with an organic water-soluble detergent surfactant such as anionic, nonionic, zwitterionic, and amphoteric detergent surfactants or mixtures thereof.

3,697,454
FOAMED POLYMER PARTICLES OF DISTINCTIVE SHAPE AND METHOD OF MAKING SAME
Robert L. Trimble, Center Township, Monaca County, Pa., assignor to Sinclair-Koppers Company, Pittsburgh, Pa.
Filed Aug. 27, 1970, Ser. No. 67,304
Int. Cl. C08j *1/14*
U.S. Cl. 260—2.5 B **6 Claims**



Foamed particles of thermoplastic polymers and copolymers are prepared by suspension of thermoplastic polymer granules or pellets in an aqueous medium, heating to deform the pellets to plano-convex, disc-shaped beads, impregnating the beads with an organic blowing agent, and expanding the beads to distinctively shaped, foamed particles having a wavy periphery and a generally rounded middle section containing a hard core of unexpanded thermoplastic polymer. The foamed particles have a diameter of about ¾ inch and a flatness index of at least 3.0. The particles are suitable for loose-fill packaging of sensitive or fragile articles.

3,697,455
METHOD FOR MAKING CELLULAR RUBBERY POLYMER
Lawrence Spenadel, Elizabeth, Homer J. Hall, Cranford, and Isidor Kirshenbaum, Westfield, N.J., assignors to Esso Research and Engineering Company
No Drawing. Filed June 22, 1959, Ser. No. 822,713
Int. Cl. C08c *17/10*
U.S. Cl. 260—2.5 R **6 Claims**

1. Method for making a gas-free cellular rubbery polymer sponge having open cells which comprises, cold mixing and milling a curable rubbery polymer, a curing agent for curing said polymer, and 5 to 30% by weight of an organic liquid blowing agent based on the weight of the polymer, said organic liquid blowing agent being a liquid having a boiling point in the range of 70° to 200° C. and at least 5° C. below the curing temperature of the polymer, and being selected from the group consisting of aromatic hydrocarbons, naphthenic hydrocarbons, paraffinic hydrocarbons, fluorine-substituted paraffins,

chlorine-substituted paraffins, and ketones free of dissolved gas and compatible with the polymer to compound the rubbery polymer with the curing agent and said organic liquid blowing agent dissolved into the polymer as plasticizer, curing the resulting compounded polymer at a curing temperature in the range of 120° to 205° C. with simultaneous blowing of the polymer undergoing curing by volatilization of said organic liquid blowing agent under about atmospheric pressure for about five minutes to an hour, the curing and blowing of the compounded polymer being thus carried out in a mold cavity in which there is room for at least 50% expansion so that the volatilized organic liquid blowing agent forms open cells in the resulting sponge matrix of the cured polymer maintained free of gas and the cells of the cured sponge are filled with vapors of the organic liquid blowing agent, which on cooling to below its boiling point condenses to a liquid that dissolves in the cured sponge polymer.

3,697,456

FLAME-RETARDANT POLYURETHANE FOAM

James J. Pitts, Wallingford, and Peter H. Scott, Guilford, Conn., assignors to Olin Corporation, New Haven, Conn.

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,430
Int. Cl. C08g *22/46, 54/56*
U.S. Cl. 260—2.5 AJ **12 Claims**

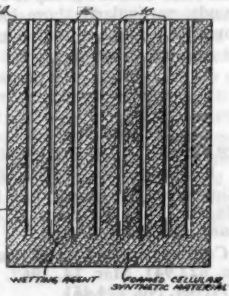
In a process for making flame-retardant polyurethane foam by incorporating in the foam forming formulation a halogenated organic compound and antimony oxide, an improvement is disclosed wherein part of the antimony oxide is replaced with another, less expensive metal oxide from the group consisting of ferric oxide, cupric oxide, titanium dioxide, and mixtures thereof.

3,697,457

SELF-WETTING FOAM PRODUCT AND METHOD OF MAKING SAME

Albert M. Palombo, Arlington, Mass., assignor to American Poly-Plastics Laboratories, Inc.

Continuation-in-part of abandoned application Ser. No. 652,229, July 10, 1967. This application Mar. 17, 1971, Ser. No. 125,441
Int. Cl. C08v *1/16*
U.S. Cl. 260—2.5 F **22 Claims**



Solid self-wetting floral foam containing ammonium neutralized residue of mineral acid catalyst with interconnected cells having connately and generally uniformly distributed unreacted anionic sulfonate wetting agent content of 1½ to 3 weight percent isolated by nonionic wetting agent from the catalyst residue and the phenolic of the foam, manufactured by mixing phenolic resin and carbon black with nonionic wetting agent, mixing in the sulfonate, adding and mixing more nonionic wetting agent, foaming the mixture with mineral acid, recovering the resulting solid foam product, and neutralizing residual acid with ammonia to turn the foam from black to green.

The nonionic wetting agent and sulfonate wetting agent additions can be split into two additions so that a portion of the nonionic wetting agent is added followed by a portion of the sulfonate, the remainder of the nonionic and then the remainder of the sulfonate. This achieves faster wetting and maximum water absorption in the foam product.

3,697,458

POLYURETHANE FOAM

Christian Burba, 1 Wilhelmstr., 4628 Lunen, Germany; Manfred Drawert, 4 Selmer Str., 4712 Werne, Germany; and Hartmut Voigt, 22 Fritz-Husemann-Str.; and Eugen Griebsch, 22 Steinstr., both of 475 Unna, Germany

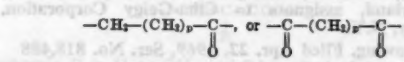
No Drawing. Filed Aug. 8, 1969, Ser. No. 848,718
Claims priority, application Germany, Aug. 15, 1968, P 17 93 201.3
Int. Cl. C08g *22/14, 22/44*
U.S. Cl. 260—2.5 AQ **1 Claim**

Polyhydroxy compounds obtained by propoxylation of compounds of the formula

$$(HO)_n—R—[OCA_2CH(OH)CH_2—]_q—Y_m$$

where Y is —OH or

R is a divalent or trivalent hydrocarbon radical, or



R_1 and R_2 are lower alkylene; and *m*, *n*, *p*, and *q* have small integral values or are, in part, zero. Methods of making these compounds by propoxylation of the reaction product of: (1) a dialkanolamine and a monohalohydrin or epihalohydrin; (2) the hydrolyzed or dialkanolamine-reacted reaction product of a diol or triol and an epihalohydrin; or (3) the reaction product of a halocarboxylic acid or dicarboxylic acid and a dialkanolamine. Methods of making rigid polyurethane foams from these polyhydroxy compounds.

3,697,459

AROMATIC POLYMERS CONTAINING AN ELEMENT OF THE PHOSPHORUS FAMILY

Bobby F. Dannels and Alvin F. Shepard, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation of application Ser. No. 749,983, Aug. 5, 1968, which is a continuation-in-part of application Ser. No. 414,867, Nov. 30, 1964. This application Mar. 20, 1970, Ser. No. 19,561
Int. Cl. C08g *5/18, 51/62*
U.S. Cl. 260—17.2 **10 Claims**

Novel esters of a member of the phosphorus family and a phenol-aldehyde or phenol-ketone condensate are characterized in that:

(1) a major proportion of the moiety of the member of the phosphorus family has the formula

in which the unsatisfied bonds are attached to aryl nuclei of the same phenolic condensate, and in which M is an atom of the phosphorus family, and X is halogen,

hydroxyl, mercapto, hydrocarbyl, hydrocarbyloxy, halogen-substituted hydrocarbyl, halogen-substituted hydrocarbyloxy, or an aryloxy radical of the same phenolic condensate to which M is attached;

(2) at least 60 percent of the phenol-aldehyde or phenol-ketone condensate has o,o'-alkylidene linkages; and

(3) the phenolic condensate has an average number of aryl nuclei per molecule in the range of 3.5 to 8.

Suitable members of the phosphorus family of elements are phosphorus, arsenic, antimony and bismuth.

The thermoplastic products of the invention can be modified to produce additional thermoplastic products such as reaction products with an oxyalkylation agent. Thermosetting products can be produced by curing the thermoplastic products of the invention with agents such as hexamethylene tetramine, or other donors of methylene radicals, or polyepoxides, or polyisocyanates, and the like. The products are useful to produce shaped articles such as molded articles, laminates, protective coatings, including drying oil varnishes; abrasive structures; friction elements and the like. Other uses are as inhibitors and stabilizers for polymers, in basing cements and as foundry sand binders. The polyurethane derivatives can be used for the preparation of foamed products, castings, coatings, and the like. Compositions of the invention are also useful for the treatment of normally combustible cellulosic materials to render them fire retardant.

3,697,460

SUBSTITUTED ESTERS OF PHENYL ACETIC ACIDS

Rolf Denss, Basel, Switzerland, Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,408

Claims priority, application Switzerland, Apr. 29, 1968, 6,377/68

Int. Cl. C07d *27/24*

U.S. Cl. 260—247.2 B **11 Claims**

Substituted [p-(1-pyrryl)-phenyl]-acetic acid aminoalkyl esters and pharmaceutically acceptable acid addition salts thereof have analgesic and anti-inflammatory activity; the compounds are active ingredients of pharmaceutical compositions and are useful for alleviating pain and treating inflammatory diseases in mammals: an illustrative embodiment is [p-(1-pyrryl)-phenyl]-acetic acid [3-(1-pyrrolidinyl)-propyl]-ester.

3,697,461

COATING MATERIALS FOR THE PRODUCTION OF ELECTRODEPOSITABLE COATINGS

Gottfried Troeger, Hiltrup, Gerhart Hermann Mueller and Gerhard Bachmann, Ludwigshafen, Herbert Spoor, Limburgerhof, and Wolfgang Batzill, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 22, 1970, Ser. No. 5,136

Claims priority, application Germany, Jan. 25, 1969, P 19 03 703.7

Int. Cl. C08g *5/20*

U.S. Cl. 260—19 U **13 Claims**

Coating materials for the production of coatings on metal substrates by electrodeposition.

These coating materials contain, as binder dissolved or dispersed in water, a mixture of a conventional phenol resin and a copolymer (partly in the form of a salt) which contains units of an acrylic or methacrylic ester, at least one copolymerizable α,β-olefinically unsaturated carboxylic acid having three to five carbon atoms, acrylamide or methacrylamide or their methylolation products (which may be etherified) and at least one oil containing an olefinically unsaturated fatty acid.

The coating materials according to the invention are suitable for coating metal articles, particularly for priming automobile bodies.

3,697,462

LIQUID CURING AGENT FOR EPOXY RESINS COMPRISING A MIXTURE OF AN IMIDAZOLE AND AN ANILINE-FORMALDEHYDE CONDENSATE

Ronald Lee De Hoff, Maplewood, N.J., assignor to R. T. Vanderbilt Company, Inc., New York, N.Y.

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,144

The portion of the term of the patent subsequent to Nov. 10, 1987, has been disclaimed

Int. Cl. C08g *45/10*

U.S. Cl. 260—21 **9 Claims**

The specification relates to a liquid curing agent for epoxy resins. The curing agent contains an imidazole compound as a first component, an anilineformaldehyde condensate having a molar ratio from 1.6:1 to 1.7:1 as a second component and a reactive amine diluent as an optional third component. The specification also relates to epoxy resin cured with this curing agent.

3,697,463

VINYL CHLORIDE RESINS STABILIZED WITH METAL COMPOUND-EPOXY COMPOUND-PHOSPHITE COMBINATIONS

Vincent Oakes, Eccleston, St. Helens, and David F. W. Cross, Liverpool, England, assignors to Interstab Limited, Liverpool, England

No Drawing. Filed Sept. 6, 1967, Ser. No. 665,725

Claims priority, application Great Britain, Sept. 8, 1966, 40,114/66, 40,115/66, 40,116/66

Int. Cl. C08f *45/58, 45/62*

U.S. Cl. 260—23 XA **1 Claim**

Halogen containing resins, e.g., vinyl chloride resins, and diolefin polymers, e.g., butadiene-styrene rubber and acrylonitrile-butadiene-styrene terpolymer are stabilized, e.g., against heat by mixed phosphites having at least one aryl group having an ortho or para directing ring activating substituent and at least one alkyl or alicyclic group. The preferred alkyl or alicyclic group is cyclohexyl. Some of the compounds, particularly those having cyclohexyl groups, are novel per se as are compounds in which the aryl group has an amino, amido, acetyl or acyloxy substituent.

3,697,464

PREPARATION OF PIGMENTARY BETA-QUINACRIDONE

Vito Albert Giambalvo, Middlesex, and Philip Randolph Ruby, Millington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 622,941, Mar. 14, 1967. This application Mar. 15, 1971, Ser. No. 124,451

Int. Cl. C07d *37/18*

U.S. Cl. 260—279 R **7 Claims**

This invention relates to a process of producing pigmentary linear quinacridone of the "beta" crystalline form by treating quinacridone material with an aryl sulfonic acid, optionally in the presence of sulfuric acid, diluting the resultant mixture with water to cause precipitation, heating the precipitated product in the aqueous menstruum and recovering the desired product from the mixture.

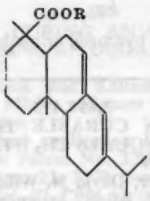
3,697,465

DECORATABLE POLYOLEFIN PLASTICS

Frederick B. Joyner, George O. Cash, Jr., and Max F. Meyer, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,371
Int. Cl. C08f *29/12*
U.S. Cl. 260—27 R 10 Claims

A polyolefin composition comprising (1) about 35 to 92 percent of a crystalline polymer of an α-olefin having 2 to 8 carbon atoms containing at least 90 percent α-olefin units and at least part of which has been chemically combined with maleic anhydride, (2) 0 to 30 percent of a crystalline ethylene polymer having a density of about 0.91 to about 0.97, (3) about 5 to 20 percent of an ethylene-propylene copolymer rubber containing 20 to 80 percent ethylene units, and (4) about 0.5 to about 15 percent of an abietic acid ester of the formula



wherein R is a hydrocarbyl group containing 1–8 carbon atoms.

These polyolefin plastics exhibit excellent adhesion to paints, lacquers, and inks without the need for expensive primers or other surface treatments. They also exhibit advantageous impact strength, especially at low temperatures.

3,697,466

POLYMER COMPOSITION

Charles I. Sullivan, Melrose, Mass., and Richard H. Cahill, Levittown, Pa., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of application Ser. No. 579,847, Sept. 16, 1966. This application June 23, 1967, Ser. No. 648,243
Int. Cl. C08f *45/24, 45/52, 19/02*
U.S. Cl. 260—29.6 TA 16 Claims

A latex polymer of (A) at least one vinyl ester of a saturated aliphatic monocarboxylic acid, (B) at least one polymerizable monovinyl aromatic monomer and (C) at least one alpha,beta-ethylenically unsaturated acid in proportions such that monomers (A), (B) and (C) comprise at least 60 percent by weight of the polymer, 90 to 99.5% by weight of monomers (A), (B) and (C) are monomers (A) and (B) in a weight ratio of (A) to (B) in the range of 4:6 to 9:1 and correspondingly 0.5 to 10% by weight is monomer (C), preferably formed by polymerizing all of monomer (A) in a first step and all of monomer (B) in a second step, compositions containing said polymer and polyvalent metal salt, alkali-insoluble, alkali-dispersible polymer, suitable for clear wood coatings and/or floor polishes.

3,697,467

AQUEOUS DISPERSION OF POLYCARBOXYLIC ACID RESIN WITH SILICA

Joseph P. Haughney, Chicago, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Nov. 3, 1969, Ser. No. 873,531
Int. Cl. C08f *29/34, 29/38*
U.S. Cl. 260—296 TA 11 Claims

There are provided an improved electrocoating process, composition and article characterized by the inclusion in each of a polycarboxylic acid resin and a minor amount of extremely finely divided silica. Electrodeposition of a dielectric coating from a bath including an acidic polymer, a base, and a minor amount of such silica enables more

nearly uniform electrocoating and when cured, as by thermal means, yields an improved product exhibiting higher dielectric breakdown voltages along edges and other contoured surfaces.

3,697,468

ETHYLENE/METHYL METHACRYLATE HOT TACK BARRIER COATINGS

Edward C. Ballard, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 677,750, Oct. 24, 1967. This application Dec. 16, 1970, Ser. No. 98,858
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 AV 2 Claims

Hot tack at low melt viscosity is provided by barrier coatings for form-fill packaging consisting essentially of (a) 20 to 50 percent by weight of ethylene/acrylic polymer consisting essentially of ethylene, 18 to 35 weight percent of acrylic ester of the general formula

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-COOR'$$

wherein R is H or CH_3 and R′ is alkyl of 1 to 4 carbon atoms, and 0 to 10 weight percent methacrylic acid, (b) 0 to 40 weight percent alkyl aromatic polymer and (c) paraffin wax to make 100 percent.

3,697,469

METHOD FOR EMULSION POLYMERIZATION OF ORGANOSILOXANES

Masanobu Ikoma, Gunma-ken, Japan, assignor to Shinetsu Chemical Company, Tokyo, Japan

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,229
Claims priority, application Japan, Apr. 9, 1968, 43/23,533
Int. Cl. C08g *31/34*
U.S. Cl. 260—29.2 M 12 Claims

When organosiloxane represented by the unit formula

$$\underset{\displaystyle 1}{R_aSiO_{\frac{4-a}{2}}}$$

where

R is a hydrogen atom or a monovalent hydrocarbon radical or a substituted monovalent hydrocarbon radical, and

a has an average value of from 1 to 3

is emulsified in water containing a salt-type or salt form of an anionic surface active agent, and then brought into contact with an acid type cationic exchange resin, said anionic surface active agent is subjected to ion exchange and turns from salt type into acid type, thereby starting the polymerization of the organosiloxane. Therefore, by this method, not only the arrangement and control of the reaction condition are made easier, but also the polymerization reaction is made to proceed uniformly, enabling the preparation of stable organopolysiloxane emulsions.

3,697,470

N-ALKYL-N-ARYLHYDROXYLAMINES AS SHORT-STOPPING AGENTS AND POPCORN POLYMER INHIBITORS

Paul G. Haines, Lafayette Hill, Pa., and Harry Elmer Albert, deceased, late of Lafayette Hill, Pa., by Dorothy S. Albert, executrix, Lafayette Hill, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed May 21, 1969, Ser. No. 827,129
Int. Cl. C08d *5/02, 7/10*
U.S. Cl. 260—29.7 N **7 Claims**

N-alkyl-N-arylhydroxylamine is disclosed as a short-stopping agent in emulsion polymerizations and as an inhibitor or suppressor of the undesirable polymerization of olefinic monomers resulting in the formation of popcorn polymers.

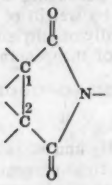
3,697,471

POLYESTER IMIDE RESIN LACQUERS

Karl Schmidt, Ferdinand Hansch, Hans-Malte Rombrecht, and Hans-Joachim Beck, Hamburg, Germany, assignors to Dr. Beck & Co. AG, Hamburg, Germany

No Drawing. Continuation of application Ser. No. 238,315, Nov. 2, 1962. This application Aug. 8, 1967, Ser. No. 659,234
Claims priority, application Germany, Nov. 2, 1961, P 12 686.5-43; Dec. 12, 1961, P 14 45 263.2; July 6, 1962, P 14 95 100.9
Int. Cl. C08g *20/32, 51/34*
U.S. Cl. 260—33.4 P **22 Claims**

Polyester imide resin having ester groups of acid and alcohol moieties in the chain, and also in the chain a content of 5-membered imide rings of the general formula:



The resin is soluble in cresol solvents and can be combined with such solvents to form a lacquer suitable for enameling of wire.

3,697,472

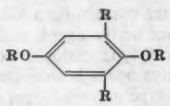
LIQUID POLYSULFIDE POLYMERIC GLASS-TO-METAL SEALANT COMPOSITION

John P. Gallagher, Hamilton Square, N.J., Robert M. Meyers, Fairless Hills, Pa., Earl H. Sorg, Trenton, N.J., and Clark M. Willitts, Levittown, Pa., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Sept. 28, 1970, Ser. No. 76,300
Int. Cl. C08g *51/04, 51/30, 51/60*
U.S. Cl. 260—33.8 R **14 Claims**

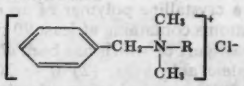
A liquid polysulfide polymer sealant composition for sealing glass to metal having greatly improved adhesion stability when exposed to ultraviolet radiation or sunlight transmitted through glass and greatly improved penetrometer cure and adhesion rate properties is obtained by use of hydroquinone and quinone ultraviolet radiation adhesion stabiliers and quaternary ammonium chloride curing and adhesion rate regulators.

Quinone and compounds having the structure

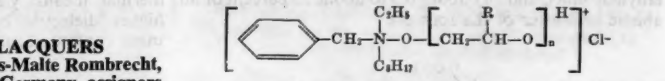


where R represents H or alkyl groups having 1–6 carbon atoms, e.g. hydroquinone and p-methoxy phenol, are effective additives for preventing loss of cohesive strength or loss of adhesion of cured polysulfide polymer compositions to glass where the sealant/glass interface is exposed to ultraviolet radiation, including sunlight. However, the addition of these adhesion stabilizers have an adverse effect on quick adhesion and curing rate of the sealant. Therefore, the addition of curing and adhesion rate regulators is required.

Improved quick adhesion and cure rate properties are obtained by the use of quaternary ammonium chlorides represented by the formula



where R represents an alkyl having 8 to 24 carbon atoms and quaternary ammonium chlorides represented by the formula



where R′ represents hydrogen or methyl and *n* is a number from 3 to 5.

3,697,473

COMPOSITION CURABLE THROUGH Si-H AND Si-CH EQUALS CH_2 WITH IMPROVED PROPERTIES

Keith E. Polmanteer, David N. Willing, and Thomas D. Talcott, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 852,103, Aug. 21, 1969. This application Jan. 4, 1971, Ser. No. 103,830
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB **20 Claims**

A composition contains a polydiorganosiloxane having two vinyl radicals, a mixture of silicon compounds having silicon-bonded hydrogen atoms where one organosiloxane compound has two silicon-bonded hydrogen atoms and the other organosiloxane compound has three to ten silicon bonded hydrogen atoms. The composition is cured by a platinum catalyst. The cured composition has elastomeric properties.

3,697,474

ORGANO-CLAY-POLYMER COMPOSITIONS

Horton H. Morris, James P. Oliver, and Paul I. Prescott, Macon, Ga., assignors to Freeport Sulphur Company, New York, N.Y.

No Drawing. Filed Oct. 30, 1969, Ser. No. 872,752
Int. Cl. C08f *45/06;* **C08k** *1/12*
U.S. Cl. 260—40 R **8 Claims**

Polymeric materials which contain as a filler an inorganic material the surface of which has been reacted with an organo derivative of ortho titanic acid containing at least two hydrolyzable groups are described. The filled polymeric materials, which may contain other conventional ingredients, can be conventionally formed to provide products having improved properties.

3,697,475

INORGANIC-ORGANO TITANATE POLYMERIC FILM

Horton H. Morris and Paul I. Prescott, Macon, Ga., assignors to Freeport Sulphur Company, New York, N.Y.

No Drawing. Filed Oct. 30, 1969, Ser. No. 872,757
Int. Cl. C08f *45/06;* **C08k** *1/12*
U.S. Cl. 260—41 A **7 Claims**

Oriented opaque ultrathin films comprising thermoplastic polymers containing up to about 60 parts by weight of an inorganic filler-organo titanate compound are described. The films are prepared by extruding the compositions as films and thereafter drawing the resultant films at a temperature below that at which the films remain translucent. The films of our invention are useful

as packaging material in preparing ultrathin paper, and in laminates, non-woven fabric, rug backing and mesh structures.

3,697,476

POLYOLEFINS CONTAINING AN IMINE MODIFIED CARBON BLACK COMPOUND

Paul Lagally, Annapolis, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Original application Oct. 29, 1969, Ser. No. 872,382. Divided and this application Jan. 14, 1971, Ser. No. 106,529

Int. Cl. C08f *45/08*

U.S. Cl. 260—41 R **2 Claims**

A cyclic imine and carbon black compound is provided which can be used as a reinforcing agent for a polyolefin material.

3,697,477

METHOD FOR CURING AN ORGANOPOLYSILOXANE USING AN ORGANOTIN AMINOCARBAMATE

Gunther F. Lengnick and Kailash Chandra Pande, Manitou Beach, Mich., assignors to Stauffer-Wacker Silicone Corporation

No Drawing. Original application Dec. 23, 1966, Ser. No. 604,139, now Patent No. 3,520,910. Divided and this application Apr. 23, 1970, Ser. No. 43,296

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 G **1 Claim**

A hydroxyl terminated organopolysiloxane is cured at room temperature with an organotin aminocarbamate.

3,697,478

POLYAMIDES FROM PSEUDO-CONJUGATED AZO-AROMATIC DIAMINES

Hartwig C. Bach and Helmuth E. Hinderer, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 782,004, Dec. 6, 1968. This application Oct. 19, 1970, Ser. No. 82,184

The portion of the term of the patent subsequent to Mar. 17, 1987, has been disclaimed

Int. Cl. C08g *20/20, 20/22*

U.S. Cl. 260—47 CZ **9 Claims**

Linear polyamides derived from aromatic diacid halides and diamines containing at least one azo linkage and at least one pseudo-conjugated aromatic radical are useful in the manufacture of fibers, films and other shaped articles.

3,697,479

POLYESTERS HAVING INCREASED WHITENESS

William E. Maycock, Charlotte, N.C., assignor to Fiber Industries, Inc.

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,854

Int. Cl. C08g *17/013, 17/08*

U.S. Cl. 260—47 C **4 Claims**

Linear synthetic polyesters having increased whiteness, the improvement in whiteness being obtained by incorporation into the polyesters of a minor amount of a difunctional compound selected from the group consisting of 1,3-bis(2-hydroxyethoxy)benzene, 3-(2-hydroxyethoxy) phenol, lower alkyl esters of adipic acid, lower alkyl esters of suberic acid, lower alkyl esters of azelaic acid, and lower alkyl esters of sebacic acid, with 1,3-bis(2-hydroxyethoxy)benzene, bis(2-hydroxyethyl) azelate, and dimethyl azelate being preferred. The polyesters may be prepared via either direct esterification or ester interchange. When ester interchange is employed the ester interchange catalyst is selected from the group consisting of salts of transition metals in groups II–B, VII–B, and VIII of periods 4 and 5 of the periodic table of the elements, with salts of manganese and cobalt being preferred. Whiteness improvements are in the range from 6 to 41 percent relative to the unmodified polyesters.

3,697,480

PROCESS FOR THE MANUFACTURE OF ESTER RESINS CONTAINING ISOCYANURATE GROUPS AND IMIDE GROUPS

Gerhard Schade, Witten-Bommern, and Franz Blaschke, Witten-Annen, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

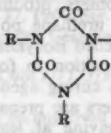
No Drawing. Filed May 14, 1970, Ser. No. 37,326

Claims priority, application Germany, May 16, 1969, P 19 24 808.9

Int. Cl. C08g *17/06, 20/32*

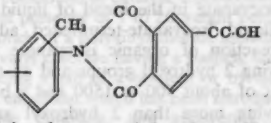
U.S. Cl. 260—47 CB **10 Claims**

Process of producing ester resins containing isocyanurate groups and imide groups in the polymer chain comprising condensing a polyalcohol with a tricarboxylic acid of the formula:



I

wherein R represents a moiety having the formula:



II

characterized by the step of forming said tricarboxylic acid by contacting triphenolic urethane trimerized tolulylene diisocyanate and trimellitic acid anhydride in a medium containing the polyalcohol, at a temperature and for a time sufficient for formation of said tricarboxylic acid.

3,697,481

CHROMANYL TERMINATED POLYCARBONATE

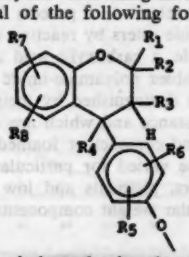
Charles A. Bialous, Mount Vernon, Allen J. Campbell, Evansville, and Frank N. Liberti, Mount Vernon, Ind., assignors to General Electric Company

No Drawing. Filed Mar. 8, 1971, Ser. No. 122,087

Int. Cl. C08g *17/13*

U.S. Cl. 260—47 XA **9 Claims**

A carbonate polymer containing as terminal groups a chromanyl radical of the following formula:



wherein R_1–R_8 are independently selected from the group consisting of hydrogen and alkyl radicals of 1–9 carbon atoms and wherein R_5–R_8 are further independently selected from the group consisting of bromine and chlorine.

3,697,482

HEAT CURABLE RESINS PREPARED FROM PHENOL, FORMALDEHYDE, DIMETHYLOLPROPIONIC ACID AND AN ALKANOLAMINE

Jerry H. Hunsucker, 7098 Williamsburg Lane, Terre Haute, Ind. 47802

No Drawing. Continuation-in-part of application Ser. No. 36,678, May 12, 1970. This application Apr. 7, 1971, Ser. No. 132,225

Int. Cl. C08g *5/18*

U.S. Cl. 260—58 **4 Claims**

Resin compositions suitable for baked coatings consisting of the condensation product of dimethylolpropionic

acid (DMPA), with a lower aliphatic aldehyde and a compound selected from the group consisting of phenol, alkyl phenol, an alkanolamine or mixtures thereof. A method is provided for coating paper with the composition.

3,697,483

SEQUENTIAL PROCESS OF PREPARING POLYURETHANE ELASTOMERS

Adolfas Damusis, Detroit, Mich., assignor to BASF Wyandottte Corporation, Wyandotte, Mich.

No Drawing. Filed Aug. 18, 1969, Ser. No. 851,099

Int. Cl. C08g *22/14*

U.S. Cl. 260—75 NE **11 Claims**

Polyurethane elastomers produced by incorporating normally solid linear urethane polymers in a blend of liquid linear and branched isocyanate-terminated adducts and curing this composition to form a solid elastomer by incorporation of a curing agent. The normally solid linear urethane polymers are prepared by reacting linear organic compounds having at least 1 active hydrogen atom and an average equivalent weight of about 31 to 400 with isocyanate in the blend of liquid adducts. The blend of liquid isocyanate-terminated adducts is prepared by reaction of organic isocyanate with a linear alcohol having 2 hydroxyl groups and an average equivalent weight of about 500 to 1500 and a branched chain alcohol having more than 2 hydroxyl groups and an equivalent weight of about 45 to 2500.

3,697,484

PREPARATION OF POLYAMIDE-IMIDE ESTERS BASED ON ISOCYANATES, ACID ANHYDRIDES AND LACTONES

Wilfried Zecher, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 11, 1970, Ser. No. 97,320

Claims priority, application Germany, Dec. 16, 1969, P 19 62 900.6

Int. Cl. C08g *22/00, 22/16*

U.S. Cl. 260—77.5 R **3 Claims**

The invention relates to a process for the preparation of polyamide-imide esters by reacting together a lactone, an acid anhydride, a carboxylic acid and an isocyanate. This process enables polyamide-imide esters to be produced which are distinguished by their particularly high temperature resistance and which are suitable for use as lacquers, foils and compact or foamed mouldings. Their properties can be varied for particular purposes by the addition of fillers, pigments and low molecular weight and high molecular weight components.

3,697,485

PROCESS FOR PREPARING POLYISOCYANURATES AND POLYURETHANES USING ORGANIC ORTHOBORATE CATALYSTS

George M. Rambosek, Maplewood, Minn., Michael George Allen, Hudson, Wis., and George Van Dyke Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed July 10, 1969, Ser. No. 840,834

Int. Cl. C08g *22/34, 22/40*

U.S. Cl. 260—77.5 NC **22 Claims**

Isocyanates are trimerized, polymerized, or reacted with polyols, in the presence of a new catalyst comprising an organic orthoborate and an alcoholate or phenolate salt to produce isocyanurates, polyisocyanurates, urethane-modified polyisocyanurates, or isocyanurate-modified polyurethanes.

3,697,486

HIGH MOLECULAR WEIGHT INCREASE OF POLYAMIDES WITH BIS(IMINO-OXAZOLIDINES)

Frank Dobinson, Gulf Breeze, and James H. Saunders, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 851,425, Aug. 19, 1969. This application Feb. 8, 1971, Ser. No. 113,709

Int. Cl. C08g *20/38*

U.S. Cl. 260—78 SC **3 Claims**

A filament-forming polycarbonamide of inordinately high molecular weight is obtained by incorporating certain bis(imino-oxazolidines) in a suitable polycarbonamide and heating the same. The preferred amount of oxazolidine is about 0.1–1.0% by weight based on the polyamide.

3,697,487

RECOVERY OF DILUENT IN ARYLENE SULFIDE POLYMER PRODUCTION

Martin R. Cines, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed May 5, 1971, Ser. No. 140,567

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 **6 Claims**

A polar organic diluent selected from amides and sulfones is extracted from an aqueous reaction mixture solid slurry. In the production of arylene sulfide polymers by the reaction of a polyhalo-substituted aromatic compound with an alkali metal sulfide in a polar organic diluent, the polar organic diluent is recovered by extraction with a solvent of the aqueous mixture of reaction effluent solids and polar organic diluent. In a preferred embodiment N-methyl-2-pyrrolidone is recovered from the aqueous reaction mixture solid slurry by extraction with a solvent such as dichloromethane or benzene.

3,697,488

PROCESS FOR POLYMERIZING EPISULFIDES

Llewellyn Delphin Booth, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 52,124, July 2, 1970, which is a continuation-in-part of application Ser. No. 701,537, June 30, 1968. This application June 14, 1971, Ser. No. 153,008

Int. Cl. C08f *3/84*

U.S. Cl. 260—79.7 **10 Claims**

A process for polymerizing episulfides which comprises contacting, at a temperature of 0° to 120° C., episulfides with 0.1 to 10.0 percent by weight of monomeric or polymeric zinc salts of 3,3′-thiodipropionic acid.

3,697,489

HIGH TEMPERATURE NITRILE ELASTOMER

Rajendra N. Chadha, Farmingdale, N.Y., and Ralph P. Arthur, George C. Schweiker, and Carroll R. Shingleton, Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 851,471, Aug. 19, 1969. This application Aug. 5, 1970, Ser. No. 61,439

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.7 **6 Claims**

An improved nitrile elastomer having superior high heat properties. This class of elastomers is constituted by tetrapolymers which are prepared by copolymerizing butadiene, acrylonitrile, α-chloroacrylonitrile and an alkyl acrylate by means of a redox emulsion process, and then vulcanizing or curing the elastomers in a conventional manner.

3,697,490

POLYMERS OF ALKOXY ALKYL ACRYLATES, ALKYL ACRYLATES AND SUBSTITUTED NORBORNENE

Philip H. Starmer, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed June 21, 1971, Ser. No. 155,243
Int. Cl. C08f *15/16, 15/18*
U.S. Cl. 260—80.76 7 Claims

Acrylate elastomers having an improved retention of abrasion resistance after oil immersion, which are readily vulcanized, are prepared with 9 to 59 percent by weight alkoxy alkyl acrylate, 40 to 90 percent by weight alkyl acrylate and about 0.5 to 5.5 percent by weight substituted norbornene compounds.

3,697,491

AMINE SALTS OF POLYHYDROSULFURIC ACIDS AS SHORTSTOPPING AGENTS FOR EMULSION POLYMERIZATIONS

Joan L. Wilson, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 21, 1970, Ser. No. 100,412
Int. Cl. C08d *1/09, 1/22, 3/02*
U.S. Cl. 260—82.3 7 Claims

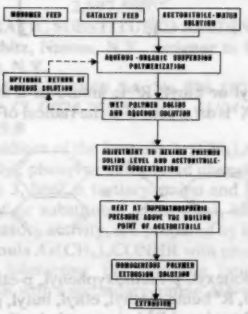
There is disclosed a method for terminating free radical initiated emulsion polymerizations which comprises adding to said free radical initiated emulsion polymerization systems at least one shortstopping agent selected from the group consisting of (A) amine salts of polyhydrosulfuric acids, and (B) mixtures of at least one amine salt of a polyhydrosulfuric acid and at least one compound selected from the group consisting of alkali metal salts of di-lower-alkyl dithiocarbamates; hydroxylamines; hydroxylamine salts; N,N-dialkylhydroxylamines and N,N′-dialkyl-N,N′-methylene bishydroxylamines.

3,697,492

ACRYLONITRILE POLYMERIZATION

Antony E. Champ, and Charles Malcolm Hendry, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed June 16, 1969, Ser. No. 833,538
Int. Cl. C08f *13/76, 15/38*
U.S. Cl. 260—85.5 ES 9 C'aims


MONOMER FEED
CATALYST FEED
ACETONITRILE-WATER SOLUTION
AQUEOUS-ORGANIC SUSPENSION POLYMERIZATION
OPTIONAL RETURN OF AQUEOUS SOLUTION
WET POLYMER SOLIDS AND AQUEOUS SOLUTION
ADJUSTMENT TO DESIRED POLYMER SOLIDS LEVEL AND ACETONITRILE-WATER CONCENTRATION
HEAT AT SUPERATMOSPHERIC PRESSURE ABOVE THE BOILING POINT OF ACETONITRILE
HOMOGENEOUS POLYMER EXTRUSION SOLUTION
EXTRUDING

A method of polymerizing acrylonitrile polymers if a novel aqueous, organic reaction medium in which the monomeric reactants are soluble whereas the polymerized acrylonitrile is insoluble under the polymerization conditions. On changing the polymerization conditions to polymer shaping conditions, the polymer becomes soluble in the reaction medium. The organic portion of the polymerization medium is a lower alkyl nitrile solvent of two to four carbon atoms, preferably acetonitrile, in an amount of 10 to 90 percent by weight of the solvent solution with the residual amount being water. The process is particularly suitable for continuous reaction wherein an effluent mixture of polymer solids and aqueous organic solution is continuously withdrawn from the reaction medium and converted to a homogeneous polymer solution suitable for extrusions such as in the production of shaped articles by heating the mixture of solvent and polymer under a superatmospheric pressure at least equal to the autogeneous pressure of the solution to temperatures above the boiling point of the lower alkyl nitrile-water phase. The process is suitable for the production of as high acrylic polymers containing 85 percent or more acrylonitrile.

3,697,493

PREPARATION OF POLYVINYLCHLORIDE

Gunther Meyer, Sieglas Augustinusstr., Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed March 27, 1969, Ser. No. 811,208
Claims priority, application Germany, March 30, 1968, P 17 70 094.6
Int. Cl. C08f *1/11, 3/30, 15/02*
U.S. Cl. 260—85.5 XA 9 Claims

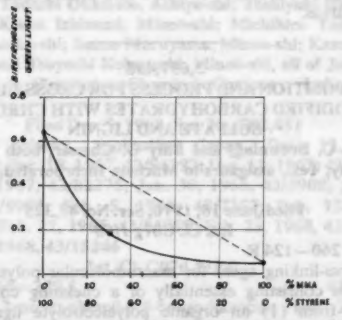
Process for preparing an improved polyvinyl chloride comprising polymerizing vinyl chloride in the presence of a peroxide and/or azo compound as catalyst, a protective colloid and in the additional presence of 1 to 20 weight percent referred to the vinylchloride of a polyvinylchloride including an emulsifier, the polyvinyl chloride having a particle size of 0.03 to 2.0 μ, introducing a salt of a bivalent or trivalent metal to precipitate the emulsifier which has been introduced with the polyvinylchloride emulsion, and recovering the polyvinylchloride product of improved properties thereby formed.

3,697,494

NON-CRAZING, BIAXIALLY ORIENTED STYRENE-METHYL METHACRYLATE COPOLYMER SHEETS

Henry Alsberg, Northbrook, Ill., assignor to The Richardson Company, Melrose Park, Ill.

Filed Dec. 21, 1970, Ser. No. 99,810
Int. Cl. C08f *15/02*
U.S. Cl. 260—86.7 2 Claims



Plastic sheets between 4 and 30 mils thickness comprising a biaxially oriented copolymer of about 55 to 80 percent styrene and 20 to 45 percent methyl methacrylate are characterized by an unexpected birefringence value, high impact strength and virtually no crazing cracks when fabricated into packages and containers.

3,697,495

PREPARATION OF POLYVINYL ALCOHOL HAVING IMPROVED COLOR PROPERTIES BY TREATING THE POLYVINYL ESTER WITH OZONE

John E. Bristol, Niagara Falls, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 5, 1970, Ser. No. 61,465
Int. Cl. C08f *27/16*
U.S. Cl. 260—91.3 PV 7 Claims

Polyvinyl alcohol having improved color properties is prepared in a process in which an alcoholic solution of the

polyvinyl ester utilized to prepare the polyvinyl alcohol is treated with ozone prior to the alcoholysis of the polyvinyl ester to the corresponding polyvinyl alcohol.

3,697,496

METHOD FOR THE POLYMERIZATION OF A COMPOUND CONTAINING AN OXIRANE GROUP

Katsuji Ueno, Hirakata-shi, Osaka; Takao Oshima, Ibaraki-shi, Osaka, and Hideo Seki, Toyonaka-shi, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed July 25, 1969, Ser. No. 845,047
Claims priority, application Japan, July 25, 1968, 43/52852; March 1, 1969, 44/15705
Int. Cl. C08g *23/14*
U.S. Cl. 260—2 A 21 Claims

Polyalkylene oxides are produced advantageously by contacting an alkylene oxide monomer with a novel and excellent catalyst obtained by reacting (i) aluminum alkoxide, (ii) phosphoric acid or an organophosphoric acid ester, and (iii) an aliphatic alcohol and/or an organometallic compound of metals of Group II or III of Mendeleev's Periodic Table.

3,697,497

HEXAMETHYLENE TETRAMINE DERIVATIVES OF ALKALI LIGNINS

Sten I. Falkehag, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 73,197
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 A 5 Claims

Hexamethylene tetramine derivatives of alkali lignins are formed by reacting, at a temperature between 70° C. and 180° C., 0.17 to 2.0 moles of a hexamethylene tetramine forming solution with 1 mole of an alkali lignin solubilized in an alkaline solution. These derivatives, characterized by having a high molecular weight and a high melting point, are useful as stabilizers in rubber emulsion, high molecular weight resin-like fillers and may be converted into products having large surface areas.

3,697,498

COMPOSITION AND PROCESS FOR CROSS-LINKING MODIFIED CARBOHYDRATES WITH CHROME SULFATE AND LIGNIN

William C. Browning, and Billy G. Chesser, both of Harris County, Tex., assignors to Milchem Incorporated, Houston, Tex.

Filed June 18, 1970, Ser. No. 47,325
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 R 9 Claims

A cross-linking agent for macromolecular polysaccharide materials consisting essentially of a chelating composition formed from (1) an organic polyelectrolyte ligand component, and (2) a component of a metal of the first series of the transition elements of the Periodic Table. This cross-linking agent has been found to provide enhanced rheological properties without obtaining metal ion overtreatment characteristics. In a preferred form, said cross-linking agent also includes a compound containing a metal from Group II of the Periodic Table. The cross-linked materials may be utilized in textile sizing agents, paints, drilling fluids, and the like.

3,697,499

POLYSULFURIZED OLEFINS

Herbert Myers, Barrington, N.J., assignor to Mobil Oil Corporation

Division of Ser. No. 620,621, March 6, 1967, Pat. No. 3,471,404. This application May 15, 1969, Ser. No. 842,055
Int. Cl. C07c *161/00*
U.S. Cl. 260—139 10 Claims

Sulfurized olefins are produced by (1) reacting sulfur monochloride with a stoichiometric excess of a low-carbon atom olefin, (2) treating the resulting product with an alkali metal sulfide in the presence of free sulfur in an alcohol-water solvent, and (3) reacting that product with an inorganic base. This reaction sequence produces novel stable oil-soluble organic sulfides having extreme pressure properties and low corrosiveness to metal. Lubricating oil compositions containing an effective amount of these additives evidence good load carrying capability.

3,697,500

WATER-SOLUBLE DISAZO PYRAZOLE DYESTUFFS CONTAINING FIBER-REACTIVE SUBSTITUENTS

Hans Ackermann, Riehen, and Fabio Beffa, Basle, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed Aug. 20, 1968, Ser. No. 753,876
Claims priority, application Switzerland, Aug. 21, 1967, 11738/67
Int. Cl. C09b *62/08*
U.S. Cl. 260—154 8 Claims

Water-soluble disazo dyestuffs are described, the molecule of which contains a 3- or 4-[pyrazolylene-(1)-benzoylamino]-6-sulphophenyl moiety wherein the 4-position of the pyrazole ring and the 1-position of the sulphophenyl group, respectively, are linked each to one of the two azo bridges in the said molecule; these dyestuffs have from zero to at most two fiber-reactive groupings and are useful as dyes for cellulose and polyamide fibers.

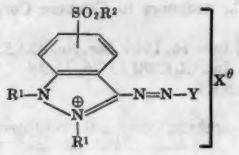
3,697,501

BASIC INDAZOLE AZO DYE SUBSTITUTED BY A SULFONAMIDE GROUP

Johannes Dehnert, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

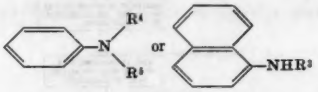
Filed Aug. 22, 1969, Ser. No. 852,505
Claims priority, application Germany, Aug. 24, 1968, P 17 95 227.1
Int. Cl. C09b *29/06, 29/08*
U.S. Cl. 260—163 4 Claims

A basic azo dye of the formula



wherein:

R^1 is methyl or ethyl, R^2 is amino or a substituted amino radical, X is an anion, Y is the radical of the formula



R^3 being cyclohexyl, p-methoxyphenyl, p-ethoxyphenyl or p-methylphenyl, R^4 being methyl, ethyl, butyl, p-methoxyphenyl or p-ethoxyphenyl and R^5 being methyl, ethyl or butyl. These dyes are useful in dyeing textile material of an acrylonitrile polymer or an anionically modified polyester in blue and violet shades with good light and wet fastness properties.

3,697,502

METHOD OF MAKING IRON DEXTRAN-PREPARATIONS

Henry Marinus Christensen, Frederiksborgvej 107, Ny-Himmelev, 4000 Roskilde, Denmark

Filed Nov. 3, 1969, Ser. No. 873,682
Int. Cl. C08b *25/04*
U.S. Cl. 260—209 D 8 Claims

A substantially pure iron-dextran preparation is produced by a specific and simple process of reacting ferric chloride and

dextran in aqueous solution in the presence of citric acid while maintaining the reaction temperature between about 50° C. and about 100° C. and the pH-value of the reaction mixture at a pH between about 9.0 and 10.0. The resulting iron-dextran preparation is substantially free of chloride ions. The novel process permits the preparation of iron-dextran preparations with a predetermined iron content.

3,697,503

LINCOMYCIN ISOTHIOURONIUM SALTS AND PROCESS FOR PREPARING SAME

Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 3, 1969, Ser. No. 873,716

Int. Cl. C07c 47/18

U.S. Cl. 260—210 R **18 Claims**

A peracylated trans-1-bromoglycoside is treated with thiourea in a tertiary amide, dipolar, aprotic solvent to form the corresponding peracylated cis- and trans-glycosyl isothiouronium salt, which is then converted to the corresponding peracylated 1-thioglycoses and alkyl peracylated 1-thioglycosides, and if desired, the cis anomers are isolated. 1-thioglycoses

---

3,697,504

PROCESS OF MAKING PURINE BASE NUCLEOSIDE-5' CARBOXYLIC ACIDS

Robert Richard Schmidt, Stuttgart, Germany, assignor to Zellstoffabrik Waldhof, Mannheim, Germany

Filed July 29, 1969, Ser. No. 846,656

Claims priority, application Germany, July 30, 1968, P 17 95 020.8

Int. Cl. C07d 51/54

U.S. Cl. 260—211.5 R **11 Claims**

Purine-nucleoside-5'-carboxylic acids are made by subjecting a purine-nucleoside, in which the 2',3'-cis-oriented hydroxy groups are protected by blocking groups, to oxidation with an excess of potassium permanganate in an alkaline aqueous solution, followed by precipitation of the 5'-carboxylic acid. Subsequently the blocking groups may be split off.

The compounds are valuable intermediates for making various pharmaceutical products, particularly cancerostatics.

3,697,505

AROMATIC SUBSTITUTED AMIDINES

Franklyn W. Gubitz, Nassau, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 3, 1969, Ser. No. 796,187

Int. Cl. C07d 27/06, 29/16, 41/04

U.S. Cl. 260—239 B **5 Claims**

Substituted amidines of the formula $Ar(CH_2)_nC(N{=}Z){=}NR$ where Ar is pyridyl, phenyl or substituted phenyl, n is O or an integer from 1 to 3, N=Z is tertiary-amino and R is lower-alkyl, lower-alkenyl or substituted lower-alkyl, having diuretic and anti-inflammatory activity, are prepared by interacting an amide of the formula $Ar(CH_2)_nCONHR$ with phosphorus pentachloride, and interacting the resulting imidyl chloride, $Ar(CH_2)_nC(Cl){=}NR$ with a secondary-amine, HN=Z.

3,697,506

CRYSTALLINE ALKALI METAL SALTS OF α-CARBOXYBENZYLPENICILLIN AND PROCESS THEREFOR

Kenneth Butler, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 804,275, March 4, 1969, which is a continuation-in-part of Ser. No. 768,497, Oct. 17, 1968, abandoned. This application Aug. 7, 1970, Ser. No. 62,138

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1 **13 Claims**

Crystalline mono-alkali metal and crystalline di-alkali metal salts of α-carboxybenzylpenicillin and a process for their preparation from crude and amorphous forms of a α-carboxybenzylpenicillin and salts thereof, and from aqueous and organic solvent solutions of α-carboxybenzylpenicillin and salts thereof.

3,697,507

ESTERS OF α-AMINOBENZYLPENICILLIN

Erling Knud Frederiksen, Holte, and Wagn Ole Godtfredsen, Vaerlose, both of Denmark, assignors to Lovens kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

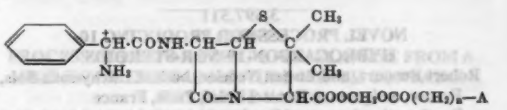
Filed Sept. 26, 1968, Ser. No. 762,987

Claims priority, application Great Britain, Sept. 29, 1967, 44,535/67; Oct. 5, 1967, 45,600/67; Oct. 23, 1967, 48,127/67; Nov. 10, 1967, 51,358/67; Dec. 6, 1967, 55,489/67; Jan. 3, 1968, 499/68; March 22, 1968, 14,041/68; March 29, 1968, 15,312/68

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1 **7 Claims**

The invention comprises antibiotically active new esters of α-aminobenzylpenicillin of the formula:



(I)

in which the asterisk indicates an asymmetric carbon atom; *n* is an integer from 0 to 5; and A is an unsubstituted or substituted aliphatic, alicyclic, aromatic, or heterocyclic radical; the salts of said esters with pharmaceutically acceptable acids; and methods of preparing the esters and salts.

3,697,508

PROCESS FOR PREPARING BENZODIAZOCINES AND BENZODIAZONINES

Hisao Yamamoto, Nishinomiya-shi; Shigeho Inaba, Takarazuka-shi; Tadashi Okamoto, Ashiya-shi; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo-shi; Michihiro Yamamoto, Takarazuka-shi; Isamu Maruyama, Minoo-shi; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Dec. 9, 1968, Ser. No. 782,451

Claims priority, application Japan, Dec. 12, 1967, 42/79925; Dec. 18, 1967, 42/81297; Dec. 21, 1967, 42/82272; Dec. 21, 1967, 42/82275; Jan. 30, 1968, 43/5908; Jan. 30, 1968, 43/5909; Feb. 5, 1968, 43/7357; Feb. 13, 1968, 43/8952; Feb. 21, 1968, 43/11299; Feb. 23, 1968, 43/11638; March 3, 1968, 43/15246

Int. Cl. C07d 53/00

U.S. Cl. 260—239.3 **42 Claims**

Novel 2-oxo-6-phenyl-1,5-benzodiazocine and 2-oxo-7-phenyl-1,6-benzodiazonine derivatives are prepared by such a manner that an indole-2-alkylamine derivative is formed by reducing an indole-2-aliphatic acid amide or thioamide, or by other processes, and oxidizing the resulting indole-2-alkylamine derivative. These 2-oxo-6-phenyl-1,5-benzodiazocine and 2-oxo-7-phenyl-1,6-benzodiazonine derivatives are useful as tranquilizers, muscle-relaxants and hypnotics.

3,697,509

N-(3-OXOPREGNA-4, 17(20)-DIEN-21-YL) QUATERNARY SALTS AND !9-NOR DERIVATIVES CORRESPONDING

Frank B. Colton, Evanston; Richard A. Mikulec, Chicago, and Robert T. Nicholson, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed April 13, 1970, Ser. No. 28,001

Int. Cl. C07c 173/00

U.S. Cl. 260—239.5 **10 Claims**

N-(3-oxopregna-4,17(20)-dien-21-yl) quaternary salts and the 19-nor derivatives thereof are prepared by alkylation of

the appropriate amine with a 21-halopregna-4,17(20)-dien-3-one or a 21-halo-19-norpregna-4,17(20-dien-3-one followed, if necessary, by ion exchange. These quaternary salts display anti-microbial properties, e.g., anti-bacterial, anti-protozoal, anti-fungal, anti-algal and anthelmintic.

3,697,510
NOVEL PREPARATION OF PREGNANES

Robert Bucourt; Lucien Nedelec, both of Clichy-sous-Bois; Jean-Claude Gasc, Bondy, and Andre Pierdet, Noisy le Sec, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 20, 1970, Ser. No. 82,482

Claims priority, application France, March 4, 1970, 7007756

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **16 Claims**

Novel process for the preparation of steroids of the pregnane series from certain estrane derivatives which pregnanes are intermediates for cortisone derivatives.

3,697,511
NOVEL PROCESS FOR PRODUCING 10-HYDROCARBON-19-NOR-STEROIDS

Robert Bucourt, and Lucien Nedelec, both of Clichy-sous-Bois, France, assignors to Roussel Uclaf, Paris, France

Continuation-in-part of Ser. No. 714,107, March 18, 1968, abandoned. This application Oct. 20, 1970, Ser. No. 82,552

Claims priority, application France, March 20, 1967, 6799496; March 4, 1970, 7007756

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **40 Claims**

A novel process for introducing a 10-hydrocarbon group into a $\Delta^{5(11)}$-19-nor-steroid by reacting a 13β-lower alkyl-$\Delta^{5(10),5(11)}$-19-nor steroid with a per carboxylic acid to form a mixture of the corresponding 5α, 10α- and 9β, 10β-epoxy steroids and reacting the latter with a hydrocarbon magnesium halide to form the corresponding 10-hydrocarbon-13β-lower alkyl-5-hydroxy-$\Delta^{5(11)}$-19-nor-steroid and to novel intermediates.

3,697,512
5-BENZYL PYRIMIDINES INTERMEDIATES

Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co.

Filed March 4, 1970, Ser. No. 16,606

Claims priority, application Great Britain, March 6, 1969, 11,908/69; March 6, 1969, 11,909/69; May 16, 1969, 25,171/69; June 13, 1969, 30,247/69

Int. Cl. C07d *29/32*

U.S. Cl. 260—240 R **32 Claims**

Compounds comprising selected N-substituted β-amino-α-benzyl-acrylonitriles and methods of preparing said compounds substantially free from the corresponding benzalacrylonitrile.

The compounds are useful as intermediates in the preparation of antibacterial and antimalerial agents.

3,697,513
HETEROCYCLIC COMPOUNDS CONTAINING ETHYLENE DOUBLE BONDS AND PROCESSES FOR THEIR MANUFACTURE

Adolf Emil Siegrist, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

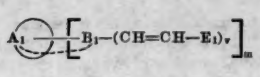
Filed April 16, 1968, Ser. No. 721,593

Claims priority, application Switzerland, April 21, 1967, 5735/67

Int. Cl. C07d *63/18*

U.S. Cl. 260—240 R **39 Claims**

The invention refers to a class of new compounds as well as a new process for making these compounds. The new compounds correspond to the general formula



wherein A_1 represents a heterocyclic ring system which (a) contains at least one five-membered to six-membered heterocyclic ring having at least one ring oxygen atom and/or one ring sulphur atom, (b) is free of ring nitrogen atoms and of hydrogen atoms which are replaceable by alkali metal, and (c) is bonded by a ring carbon atom to a ring carbon atom of B_1, or has two adjacent ring carbon atoms in common with two adjacent ring carbon atoms of B_1, and wherein furthermore (a) B_1 denotes a benzene ring or a heterocyclic ring of aromatic character containing five to six ring members, with these rings being permitted to contain further condensed-on aromatic, heterocyclic or hydroaromatic five-membered to six-membered rings, but preferably only one such ring, and (b) v denotes an integer from 1 to 2, and (c) wherein m denotes an integer from 1 to 4 in the case of a single bond between A_1 and B_1, and denotes the numbers 1 or 2 in the case of rings A_1 and B_1 being condensed with one another, and wherein E_1 represents an aromatic carbocyclic or heterocyclic rings system containing five to six ring members, which may contain further condensed-on aromatic or hydroaromatic ring system of carbocyclic or heterocyclic nature, and may contain aromatic, araliphatic, cycloaliphatic, aliphatic or other non-chromophoric substituents, with the exception of methyl groups, which are capable of carbanion formation in the presence of alkali metal ions.

3,697,514
4-NITROPYRROLE-2-CARBOXYLIC ACID AMIDE DERIVATIVES

Shigeru Yamabe, Toyonaka-shi; Masanao Shimizu, Kobe-shi, and Tadatsugu Yamamoto, Nara-shi, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

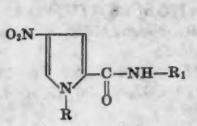
Filed Dec. 29, 1969, Ser. No. 888,427

Claims priority, application Japan, Dec. 29, 1968, 43/725; Jan. 7, 1969, 44/1434

Int. Cl. C07d *27/26*

U.S. Cl. 260—240 G **2 Claims**

Novel 4-nitropyrrole-2-carboxylic acid amide derivatives of the general formula I below:



I

in which R is selected from the group consisting of hydrogen atom and alkyl groups of one to eight carbons, and R_1 is selected from the group consisting of amino, amidino, and

groups, R_2 and R_3

being each selected from the group consisting of hydrogen, alkyl of one to eight carbons, phenyl, and substituted phenyl, and which may be same or different, processes for their preparation, pharmaceutical compositions comprising said derivatives, and a method for using said compositions. These novel derivatives exhibit anti-Trichomonas vaginalis action as well as a very unique action of promoting release of virus out of cells.

3,697,515

PROCESS FOR SPLITTING THE 7-N-ACYL GROUP FROM CEPHALOSPORIN COMPOUNDS

Bruno Fechtig, Binningen; Ernst Vischer, Basel; Hans Bickel, Binningen; Rolf Bosshardt, Arlesheim, and Jakob Urech, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 842,359, July 16, 1969, abandoned, Continuation-in-part of Ser. No. 493,223, Oct. 5, 1965, abandoned, which is a continuation-in-part of Ser. No. 344,803, Feb. 14, 1964, abandoned. This application Nov. 19, 1971, Ser. No. 200,511

Claims priority, application Switzerland, Feb. 18, 1963, 1992/63; March 1, 1963, 2675/63; April 3, 1963, 4249/63; June 13, 1963, 7358/63; July 2, 1963, 8246/63; Oct. 2, 1963, 12112/63; Nov. 6, 1963, 13600/63; Jan. 22, 1964, 730/64; Oct. 9, 1964, 13166/64; Nov. 13, 1964, 14696/64

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 24 Claims

The present invention is directed to an improved process for splitting the N-acyl group in 7-position from cephalosporin type compounds. It is characterized by formation of the N_7-imide halide, conversion of the latter into the iminoether and splitting of the C=N double bond of the latter.

3,697,516

CERTAIN THIAZINE-2-THIONE COMPOUNDS AND METHOD OF PREPARING SAME

Jack E. Reece, Willernie, Minn., and George B. Fozzard, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Oct. 19, 1970, Ser. No. 82,175

Int. Cl. C07d *93/08*

U.S. Cl. 260—243 R 5 Claims

Certain thiazolidine- and thiazine-2-thione compounds, including 5-carboxythiazolidine-2-thione and 3,4-tetramethylene-4H,5,6-dihydro-1,3-thiazine-2-thione, and methods for preparing same are disclosed.

3,697,517

1,3-BENZOXAZINES

Jurgen Kurz; Kolling Heinrich, and Manfred Federmann, all of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 634,835, May 1, 1967, abandoned. This application March 28, 1969, Ser. No. 832,527

Int. Cl. C07d *87/00*

U.S. Cl. 260—244 R 5 Claims

New thionosalicyclic acid anilides and salts with bases are provided which have parasiticidal activity in sheep and cattle particularly against adult liver flukes in sheep and cattle and other domestic animals, especially against juvenile liver flukes. The new compounds are reaction products of poly-substituted phenols with substituted aromatic isothiocyanates, the hydrolysis products of oxo-thiono- or dithiono-dihydrobenzoxazines or the reaction products of N-phenyl-salicyl-imide chlorides with thio-compounds. Typical compounds are 3,5-dichloro-4'-bromo-thionosalicylic acid anilide and 2-acetoxy-3,5-dichloro-N-(2'-methyl-4'-chlorophenyl)-thionobenzamide. Novel benzoxazines obtainable from the above anilides are also provided and have similar properties Typical compounds are 3-(3',5'-bis-trifluoromethyl-phenyl)-6,8-dibromo-21-oxo-4-thiono-dihydrobenzoxazine-(1,3), 3-(3',4'-dichlorophenylc6,8-dichloro-2,4-dithiono-dihydrobenzoxazine-(1,3) and (4'-bromophenyl)-6-chloro-8-bromo-2,4-dithiono-dihydrobenzoxazine-(1,3). Methods for preparing a large number of both types of compounds are described. The compound are administered orally or subcutaneously in doses of 2.5 to 100 mg/kg, preferably 5 to 15 mg/kg, of body weight.

3,697,518

PHOSPHORUS ACID ESTERS OF 3-HYDROXY-BENZO-1,2,4-TRIAZINE -1-N-OXIDE

Karl-Julius Schmidt, Wuppertal-Vohwinkel, and Ingeborg Hammann, Cologne, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 10, 1969, Ser. No. 875,553

Claims priority, application Germany, Nov. 16, 1968, P 18 09 390.8

Int. Cl. C07d *55/10*

U.S. Cl. 260—248 AS 10 Claims

Phosphorus acid esters of 3-hydroxy-benzo-1,2,4-triazine-1-N-oxide, i.e. phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters of 3-hydroxy-benzo-1,2,4-triazine-1-N-oxide, or 3-[(alkyl, phenyl and O-alkyl)-O-alkyl-phosphoryloxy, phosphonyloxy, thiono-phosphoryloxy and thionophosphonyloxy]-benzo-1,2,4-triazine-1-N-oxide, which possess arthropodicidal especially acaricidal and insecticidal, properties, and which may be produced by conventional methods.

3,697,519

PROCESS FOR SEPARATING OFF MELAMINE FROM A HOT SYNTHESIS GAS MIXTURE WHICH CONTAINS MELAMINE VAPOR

Petrus J. C. Kaasenbrood, Sittard, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Continuation-in-part of Ser. No. 837,479, June 30, 1969. This application Dec. 9, 1970, Ser. No. 96,466

Claims priority, application Netherlands, Dec. 11, 1969, 6918571

Int. Cl. C07d *55/24*

U.S. Cl. 260—249.7 P 6 Claims

A process relating to the separation of melamine from hot synthesis gas mixtures is described, wherein such gases are contacted directly with a urea melt containing ammonium carbamate, so that the desublimation heat released as the melamine is converted from the vapor to the solid state is utilized for the decomposition of the ammonium carbamate to release ammonia and carbon dioxide.

3,697,520

TRIAZINE CARBOXYLIC ACIDS AND ESTERS

Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy AG, Basel, Switzerland

Filed April 30, 1970, Ser. No. 33,527

Int. Cl. C07d *55/22*

U.S. Cl. 260—249.6 12 Claims

Triazine carboxylic acids and esters are useful as starting materials in the preparation of high temperature polymers, antioxidants and plastercizers.

These compounds are prepared by reacting cyanuric chloride or an amino substituted dichloro-s-triazine with amino acids or amino esters in the presence of a base and water.

3,697,521

INTEGRATED PROCESS FOR THE PREPARATION OF UREA AND MELAMINE

Petrus J. M. Van Nassau, Geleen; Wilhelmus K. Brand, Munstergeleen, and Petrus J. C. Kaasenbrood, Sittard, all of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Dec. 15, 1970, Ser. No. 98,466

Claims priority, application Netherlands, Dec. 20, 1969, 6919152

Int. Cl. C07d *55/28*

U.S. Cl. 260—249.7 A 4 Claims

An integrated process for the preparation of urea and melamine is described wherein heat requirements for the decomposition of ammonium carbamate contained in the urea

product solution, which is cycled as feed to the melamine synthesis stage, is supplied, at least in part, from the heat released by the desublimation of the melamine vapors obtained in the melamine synthesis gas product stream, by bringing this gas stream into direct contact, either in counter-current or co-current flow, with the ammonium carbamate-containing urea product solution.

3,697,522

PYRIDAZONE DERIVATIVES

Franz Reicheneder; Rudolf Kropp, both of Ludwigshafen, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Feb. 3, 1969, Ser. No. 796,182

Claims priority, application Germany, Feb. 10, 1968, P 16 70 315.4

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 4 Claims

New and valuable pyridazone derivatives, especially m-trifluoromethylphenyl pyridazone derivatives, and a process for controlling unwanted plants with these compounds.

3,697,523

2-SUBSTITUTED-11-(4-METHYL-1-PIPERIZINYL)-DIBENZO [B,F]-1,4-OXAZEPIN-(4-OXIDE)

Fritz Hunziker, Berne, and Jean Schmutz, Muri b/Berne, both of Switzerland, assignors to Sandoz Ltd., (aka Sandoz AG), Basle, Switzerland

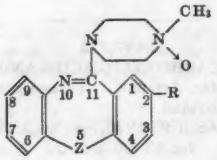
Filed Aug. 12, 1969, Ser. No. 849,522

Claims priority, application Switzerland, Aug. 23, 1968, 12731/68; Nov. 4, 1968, 16388/68; Jan. 24, 1969, 1042/69; May 2, 1969, 6772/69

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR 1 Claim

The invention concerns novel compounds of the formula:



wherein Z is oxygen or sulfur, and R is chlorine, bromine, nitro or methyl, and pharmaceutically acceptable acid addition salts thereof. A process for the production of the above compounds is also described.

The compounds are useful neuroleptics.

3,697,524

PROCESS FOR PREPARING 1,4-DISUBSTITUTED PIPERAZINES

Donald A. Tomalia, and Narayanlal D. Ojha, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1969, Ser. No. 873,121

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 SY 8 Claims

1,4-Disubstituted piperazines are prepared by contacting a basic catalytic aziridine with sulfur dioxide in the presence of a catalytic amount of iodide ion. In example, N-ethylaziridine dimerized when contacted with sulfur dioxide and a catalytic amount of sodium iodide to form 1,4-diethylpiperazine.

3,697,525

FLUORESCENT NAPHTHALIMIDE DERIVATIVES

Hitoshi Okada; Seiichi Imahori, and Susumu Hirako, all of Tokyo, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

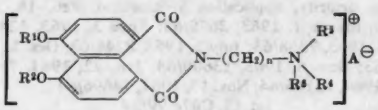
Filed June 4, 1969, Ser. No. 830,504

Claims priority, application Japan, June 8, 1968, 43/39102; June 8, 1968, 43/39103; June 8, 1968, 43/44712

Int. Cl. C07i *39/00*

U.S. Cl. 260—281 7 Claims

Naphthalimide derivatives of the formula



wherein R^1, R^2, R^3, and R^4 are lower alkyl, R^5 is hydrogen, lower alkyl or carbamoyl methyl, n is 2 or 3, and A is an anionic radical, are effective optical brighteners for acrylic fibers and cellulose acetate when dyed from an acid aqueous bath. They are prepared by quaternizing corresponding tertiary amines with inorganic or organic acids, lower alkyl esters which are known alkylating agents, or chloroacetamide.

3,697,526

CRYSTALLINE PERYLENETETRACARBOXYLIC ACID DIBENZOYLHYDRAZIDE

Andre Pugin, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 17, 1970, Ser. No. 90,423

Claims priority, application Switzerland, Nov. 28, 1969, 17777/69

Int. Cl. C07d *39/00*

U.S. Cl. 260—281 1 Claim

Crystalline perylenetetracarboxylic acid dibenzoyl-hydrazide is prepared by condensing perylenetetracarboxylic acid dianhydride with benzhydrazide in the presence of non-basic solvents or in the presence of a mixture of basic and non-basic solvents. The compound is used as pigment.

3,697,527

DOETHYL PHENYL SULFONYLUREAS

Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 2, 1970, Ser. No. 94,522

Int. Cl. C07d *31/44*

U.S. Cl. 260—294.8 C 9 Claims

New [pyrazolo[3,4-b]pyridin-5-ylformamidoethyl]-phenylsulfonylureas are useful as hypoglycemic agents.

3,697,528

RADIATION SENSITIVE MATERIALS CONTAINING BIPYRIDILIUM SALT OF A STRONG ACID

Timothy Douglas Andrews; Glyn David Short, both of Northwich, and Ieuan Thomas, Frodsham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 26, 1970, Ser. No. 40,714

Claims priority, application Great Britain, May 28, 1969, 26,925/69; Sept. 12, 1969, 45,151/69; Nov. 24, 1969, 57,392/69

Int. Cl. C07d *31/46*

U.S. Cl. 260—294.9 2 Claims

A radiation sensitive material based on nitrogeneous dications such as bipyridyls, preferably with a water soluble polymer as a support. Sensitisers and desensitisers are described. The materials are sensitive to X-rays, electrons and UV up to about 500 nm, in the presence of sensitisers.

3,697,529

ARALKYL PENTA-AND HEXAMETHYLENIMINE AND INTERMEDIATES THEREFOR

Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.

Division of Ser. No. 799,943, Feb. 17, 1969, Pat. No. 3,637,659, which is a continuation-in-part of Ser. No. 717,363, March 29, 1968, abandoned. This application Jan. 28, 1971, Ser. No. 110,615

Int. Cl. C07d *29/24*

U.S. Cl. 260—293.81 3 Claims

The compounds are of the class of aralkyl penta- and hexamethylenimines which are useful as anti-arrhythmic agents; and to certain intermediates useful in the syntheses of such methylenimines.

3,697,530

OXADIAZOLE DERIVATIVES

Yoshio Imai, Hyogo; Haruki Matsumura, Osaka; Shojiro Yurugi, Kyoto, and Akio Miyake, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

Filed Dec. 31, 1970, Ser. No. 103,294

Int. Cl. C07d *31/34, 85/52*

U.S. Cl. 260—295 R 34 Claims

The present invention is concerned with certain 5-aryl or heteroaryl-1,2,4 oxadiazoles and derivatives and methods for their preparation. The compounds possess hypocholesterolemic activity.

3,697,531

N,N'-ALKYLENEBIS(PYRIDINE-CARBOXAMIDES)

George Y. Lesher, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 119,027

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 AM 16 Claims

N,N'-Alkylenebis(alkoxypyridinecarboxamides) where alkylene has from seven to ten carbon atoms inclusive, having endocrinological properties, are prepared either by reacting an alkylenediamine with an alkoxypyridinecarboxylic acid or stepwise by reacting an alkylenediamine with an hydroxypyridinecarboxylic acid, halogenating the resulting N,N'-alkylenebis(hydroxypyridinecarboxamide) to form the corresponding N,N'-alkylenebis(halopyridinecarboxamide) and reacting said halopridinecarboxamide with a metal lower-alkoxide.

3,697,532

5-METHYLDIPYRAZOLO [3,4-B;3',4'-D] PYRIDIN-3(2H)-ONES

Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Aug. 12, 1970, Ser. No. 63,326

Int. Cl. G07d *31/44*

U.S. Cl. 260—295.5 T 9 Claims

New 5-methyldipyrazolo[3,4-b:3',4'-d]pyrdiin-3(2H)-ones are useful as central nervous system depressants. This type of compound also increases the intracellular concentration of adenosine-3',5'-cyclic monophosphate.

3,697,533

2-(2-METHYLAN ILINO)-NICOTINIC ACID

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Bloomfield, N.J.

Continuation-in-part of Ser. No. 866,012, Oct. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 835,743, June 23, 1969, abandoned. This application March 26, 1971, Ser. No. 128,514

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R 3 Claims

This invention relates to 2-(2-methylanilino)-nicotinic acid, the non-toxic pharmaceutically acceptable salts thereof and to the methods for the preparation and use thereof.

The tangible embodiments of this invention are prepared by condensing a 2-halonicotinic acid, or a functionally reactive equivalent thereof, with an o-toluidine, or a functionally reactive equivalent thereof, to produce either 2-(2-methylanilino)-nicotinic acid or a derivative which is convertible thereinto.

3,697,534

PREPARATION OF 2,2'-BIPYRIDYL

Dhafir Yusuf Waddan, and Derek Williams, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 1, 1969, Ser. No. 862,944

Claims priority, application Great Britain, Oct. 3, 1968, 47,023/68

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D 4 Claims

Pyridines are converted into 2,2'-bipyridyls by treatment with Ziegler catalysts.

3,697,535

4,5-DIHYDROIMIDAZOLINE-3-OXIDE-1-OXYL

Richard K. Leute, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Synvar Associates,, Palo Alto, Calif.

Filed Dec. 15, 1969, Ser. No. 885,332

Int. Cl. C07d *105/00*

U.S. Cl. 260—299 9 Claims

4,5-dihydroimidazoline-3-oxide-1-oxyl-2-yl mercuric compounds having tertiary carbon atoms in the number 4 and 5 positions of the imidazoline ring. Typical is 4,4,5,5-tetramethylimidazoline-3-oxide-1-oxyl-2-yl mercuric chloride.

3,697,536

COMPOSITION OF MATTER

Mervin E. Brokke, Richmond, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 490,664, Sept. 27, 1965, Pat. No. 3,513,172. This application Nov. 20, 1969, Ser. No. 877,538

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 R 1 Claim

This invention relates to the compound 2-(3,4,4-trifluoro-3-butenylthio)-4-methylthiazole which is effective as a nematocide.

3,697,537

2-(ARYLOXY)-2-THIAZOLINIUM COMPOUNDS

Donald A. Tomalia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1967, Ser. No. 671,957

Int. Cl. C07d *91/24*

U.S. Cl. 260—306.7 9 Claims

2-(Aryloxy)-2-thiazolinium hydrochlorides (A) and chlorides (B), useful as pesticides, are prepared by reacting, for (A) compounds, an N-unsubstituted aziridine with an aryloxy-thiocarbonyl chloride; and by reacting, for (B) compounds, an N-alkyl- or an N-arylaziridine with an aryloxy-thiocarbonyl chloride. The 2-(aryloxy)-2-thiazolines are liberated from their thiazolinium hydrochlorides by reaction with aqueous base.

3,697,538

2,4,5-SUBSTITUTED N-OXY AND HYDROXYIMIDAZOLES

David G. B. Boocock, Palo Alto, and Edwin F. Ullman, Atherton, both of Calif., assignors to Synvar Associates, Palo Alto, Calif.

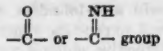
Filed June 3, 1968, Ser. No. 733,820

Int. Cl. C07d *49/36*

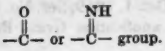
U.S. Cl. 260—309 12 Claims

Dihydroimidazoles having tertiary carbon atoms in the number 4 and number 5 positions of the imidazole ring, ox-

idized ring nitrogen atoms in the form of oxides and hydroxides and a



attached to the carbon atom at the 2 imidazole ring position. The free radical structures are useful as spin labels when bonded to other molecules through the



3,697,539

BIS-(1-γ-AMINOPROPYL-HYDANTOINYL-3)-ALKANES

Daniel Porret, Binningen, and Juergen Habermeier, Allschwil, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 12, 1969, Ser. No. 876,037
Claims priority, application Switzerland, Nov. 22, 1968, 17419/68
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 5 Claims

New bis-(1-γ-aminopropyl-hydantoinyl-3)-alkanes, for example 1,6-bis-(1′-(γ-aminopropyl)-5′,5′-dimethylhydantoinyl-3′)-hexane or β,β′-bis-(1-(3′-aminopropyl)-5,5-dimethylhydantoinyl-3)-diethyl ether, and their use as curing agents in curable moulding, coating and adhesive compositions which contain a polyepoxide compound, for example a liquid polyglycidyl ether of bisphenol A. Curing can be carried out at relatively low temperatures, for example at 40° C. The new type of curing agent bridges, in respect of its gradation of reactivity, a gap between aliphatic polyamines and cycloaliphatic polyamines. The new curing agents furthermore have the advantage relative to the aromatic polyamines of being non-toxic.

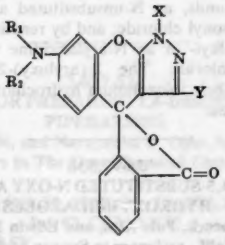
3,697,540

CHROMENOPYRAZOL AND PROCESS FOR PREPARATION THEREOF

Shiro Kimura; Sadao Ishige, and Teruo Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 16, 1969, Ser. No. 858,522
Claims priority, application Japan, Sept. 16, 1968, 43/66822
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 11 Claims

Chromenopyrazol compounds having the formula



and a process for their preparation are disclosed. The chromenopyrazol compounds are useful as couplers in pressure-sensitive duplicating papers.

3,697,541

PROCESS FOR THE MANUFACTURE OF PYROMELLITIC ACID DIIMIDE

Gunther Ibing, Gladbeck, and Kurt Neubold, Bottrop, both of Germany, assignors to Scholven-Chemie Aktiengesellschaft

Filed June 30, 1969, Ser. No. 837,946
Claims priority, application Germany, July 10, 1968, P 17 70 840.6
Int. Cl. C07d *27/52*
U.S. Cl. 260—326 C 7 Claims

Pyromellitic acid diimide is manufactured with yields of greater than 99 percent by the reaction of pyromellitic acid or its anhydride with formamide in an organic solvent at an elevated temperature of up to about 170°C and under an inert atmosphere.

3,697,542

METHOD OF PRODUCING α-CARBOXYLATED 5-MEMBERED LACTONES

William L. Parker, North Brunswick, N.J.; Francis Johnson, Newton Lower Falls, and John Martin, Framingham, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 10, 1969, Ser. No. 875,520
Int. Cl. C07d *27/28*, *5/06*, *5/46*
U.S. Cl. 260—326.3 9 Claims

Five-membered lactones are α-carboxylated by reacting in solution the lactone with methyl methoxy-magnesium carbonate. The lactone reactants are restricted to those having an α-methylene group.

3,697,543

EPITHIO COMPOUNDS

Albert Pfiffner, Arlesheim, and Ulrich Schwieter, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 16, 1969, Ser. No. 858,534
Int. Cl. A61k *27/00*; C07d *59/00*
U.S. Cl. 260—327 E 7 Claims

Epithio unsaturated aliphatic acids, nitriles, and alcohols, and ether, ester and amide derivatives thereof and epoxy unsaturated aliphatic acids, nitriles, and alcohols, and ether, ester and amide derivatives thereof, which are useful in killing and preventing proliferation of insects by upsetting their hormone balance.

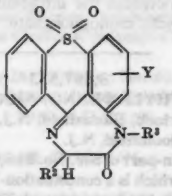
3,697,544

THIAXANTHONE-10,10-DIOXIDES

Edward L. Engelhardt, Gwynedd Valley, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 661,784, Aug. 21, 1967, Pat. No. 3,530,116. This application March 19, 1970, Ser. No. 21,795
Int. Cl. A61k *27/00*; C07d *65/18*
U.S. Cl. 260—328 9 Claims

This invention pertains to pharmacologically active compounds of the following structure:



wherein Y is hydrogen, halo, alkyl, NO_2, perfluoroalkyl, cyano, PO—, RSO_2—, R_2NSO_2—, R_2NCO— (R being alkyl, aryl, aralkyl, alkaryl or hydrogen); and R^2 is alkyl, aryl, aral-

kyl, alkaryl or hydrogen and R^3 is alkyl, aralkyl or hydrogen. The disclosed process is summarized in the flow sheet at pages 2–3 of the specification. The compounds exhibit anti-anxiety activity and a depressant effect on the central nervous system.

3,697,545

IRRADIATED PRODUCTS OF 3H-1,4-BENZODIAZEPINE 4-OXIDES

George Francis Field, West Caldwell, and Leon Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 665,293, Sept. 5, 1967, Pat. No. 3,555,022. This application Sept. 19, 1969, Ser. No. 861,545
Int. Cl. C07d *87/54*
U.S. Cl. 260—333 1 Claim

1,3,6-Benzoxadiazocines and 1,2-dihydro-quinoxalines are useful as anti-inflammatory agents, anti-convulsants and anti-bacterial agents and methods for their production.

3,697,546

METHOD OF PRODUCING TRIOXAN

Kazuo Asakawa, and Kaoru Narita, both of Niigata-shi, Japan, assignors to Japan Gas-Chemical Company, Inc. Tokyo, Japan

Filed Jan. 14, 1970, Ser. No. 2,694
Int. Cl. C07d *19/00*
U.S. Cl. 260—340 8 Claims

The present invention relates to a method of producing trioxan which involves heating a liquid mixture of formaldehyde and a lower aliphatic hydrocarbon in the presence of a solid acid catalyst. More specifically, according to the present invention, raw formaldehyde having a relatively high water content can be used as the starting material by removing the water from the system in an azeotropic mixture with the lower aliphatic dihalide by a distillation procedure and heating the residual formaldehyde—lower aliphatic hydrocarbon halide in the presence of a solid acid catalyst to form the objective trioxane product.

3,697,547

ERYTHRONOLIDE B DERIVATIVES

Paul Kurath, Waukegan, and Richard Stephan Egan, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 18, 1970, Ser. No. 99,641
Int. Cl. C07d *9/00*
U.S. Cl. 260—343 3 Claims

8,9-Anhydroerythronolide B 6,9-hemiketal and 8-hydroxyerythronolide B are respectively successive intermediates for the preparation of 3-mycarosyl-8-hydroxyerythronolide B which is useful as an antipyretic.

3,697,548

ZEARALENONE REDUCTION

Edward B. Hodge, Terre Haute, Ind., assignor to Commercial Solvents Corporation

Filed April 2, 1970, Ser. No. 25,265
Int. Cl. C07d *9/00*
U.S. Cl. 260—343.2 F 9 Claims

A method for reducing zearalenone to zearalanol in which the product contains a major amount of the high melting diastereoisomer and a minor amount of the low melting diastereoisomer of zearalanol is disclosed. Zearalenone is catalytically reduced with hydrogen in the presence of a solvent, a strong acid, and a platinum catalyst for a time sufficient to reduce the zearalenone to zearalanol.

3,697,549

2,3-CYCLOETHYLENE-3-METHYLPENTANO-5-LACTONE

John B. Siddall, Palo Alto, Calif., assignor to Zoicon Corporation, Palo Alto, Calif.

Division of Ser. No. 880,966, Nov. 28, 1969. This application June 25, 1971, Ser. No. 156,943
Int. Cl. C07d *7/06*
U.S. Cl. 260—343.2 R 1 Claim

Synthesis of cis 2-(1′-methyl-2′-isopropenylcyclobutyl)ethanol, a component of the boll weevil sex attractant, and intermediates therefor, in which 5-hydroxypent-2-ynoic acid or ethers thereof is methylated followed by cyclization to yield 3-methylpent-2-eno-5-lactone which is irradiated in presence of ethylene to yield 2,3-cycloethylene-3-methylpentano-5-lactone which is cleaved and converted into 2-(1′-methyl-2′-isopropenylcyclobutyl)ethanol.

3,697,550

VAPOUR PHASE OXIDATION OF BENZENE TO MALEIC ANHYDRIDE USING AN ALUMINUM PHOSPHATE SUPPORTED CATALYST

John Bayne; Ian Robert King, and John Richard Morey, all of Luton, England, assignors to Laporte Industries Limited, London, England

Filed Dec. 17, 1970, Ser. No. 99,315
Claims priority, application Great Britain, Dec. 19, 1969, 61,900/69
Int. Cl. C07c *57/14*
U.S. Cl. 260—346.8 10 Claims

This invention relates to the use of a support of aluminium phosphate in the cristobalite form in a process for the vapor phase oxidation of benzene to maleic anhydride in which a gaseous mixture containing benzene and oxygen with an inert diluent gas is contacted at a temperature in the range of 350° to 450° C with the supported catalyst, whose catalyst component, present to the extent of between 5 and 30 percent by weight in the supported catalyst, comprises two or more of vanadium oxide, molybdenum oxide, tungsten oxide and phosphorus oxide.

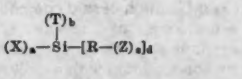
3,697,551

SILANE SULFONYL AZIDES

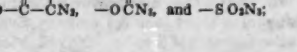
J. Brent Thomson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 789,974, Dec. 31, 1968, abandoned. This application Sept. 30, 1969, Ser. No. 862,531
Int. Cl. C07c *117/00*
U.S. Cl. 260—349 3 Claims

Disclosed are nitrogen containing silane compounds of the formula



where R is an organic radical, X is selected from halo, hydroxy, alkoxy, aryloxy, organo oxycarbonyl, azido, amine, and amide radicals; T is selected from alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals; a is an integer from 1 to 3; b is an integer from 0 to 2; c is an integer from 1 to 10; d is an integer from 1 to 3; and $a+b+d$ equals 4; and Z is selected from



where R′ is selected from hydrogen, alkyl, cycloalkyl, aryl and —COOR″ radicals; where R″ is selected from alkyl, cycloalkyl, and aryl radicals. Also disclosed is a process to promote the adhesion of polymers to siliceous materials, metals, metal oxides, and other polymers using the said silane compounds.

In particular, there is disclosed a process of improving the adhesion of tire cord to rubber tire stock using the said silane compounds. The cross-linking of polymers with the silane compounds is also disclosed.

3,697,552

ANTHRACYCLIDINE-ACETIC ACID DERIVATIVES

Lloyd H. Conover, Quaker Hill, Conn., and Robert B. Woodward, Belmont, Mass., assignors to Pfizer Inc.

Division of Ser. No. 569,052, Aug. 1, 1966, Pat. No. 3,509,184, which is a continuation-in-part of Ser. No. 209,269, July 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 132,304, Aug. 18, 1961, abandoned. This application Oct. 31, 1969, Ser. No. 873,077

Int. Cl. C07c *49/76*

U.S. Cl. 260—351 11 Claims

The total synthesis of tetracycline-type antibiotics by a multistep process beginning with 3,4,10-trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracenes comprising: (1) an aldol condensation with a glyoxalic acid ester to give a 2-carboxymethylidene-3,4,10-trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracene ester; (2) Michael reaction of said ester with an amine to produce a 3,4,10-trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracene-2-(α-amino)acetic acid ester; (3) conversion of the triketone to the corresponding 4,10-diketone by (a) selective reduction of the Michael reaction product to the corresponding 3-hydroxy compound, followed by conversion of the 3-hydroxy compound to the corresponding 3-formyloxy compound and removal of the 3-formyloxy group by treatment with zinc dust to give a 4,10-dioxo-1,2,3,4,4a,9,9a,10-octahydroanthracene-2-(α-amino)acetic acid ester; or (b) conversion of the hydrochloride salt of the Michael reaction product to a lactone by reaction with p-toluene-sulfonic acid and treatment of the lactone with zinc dust formic acid; (4) conversion of the 4,10-diketo-1,2,3,4,4a,9,9a,10-octahydroanthracene-2-(α-amino)acetic acid to a mixed anhydride; (5) followed by acylation of a malonic acid ester with the mixed anhydride; (6) cyclization of the acyl malonate derivative to a 12a-deoxytetracycline which is then hydroxylated to a tetracycline. The preparation of the 3,4,10-trioxo-1,2,3,4,4a,9,9a,10-octahydroanthracenes from benzoyl halides by (a) Friedel-Crafts reaction of a benzoyl halide with a pyrocatechol ether, e.g., a di-(lower)alkyl ether, to produce a 3,4-di-(lower)alkoxybenzophenone; (b) conversion of the benzophenone by partial or complete reduction of the carbonyl group by chemical or catalytic methods to a 3,4-di-(lower)alkoxy diphenyl methanol or 3,4-di-(lower)alkoxy diphenyl methane; or to a 3,4-di-(lower)alkoxy diphenyl alkane via a Grignard reaction and reduction of the thus-produced alkanol; (c) oxidation of the 3,4-di-(lower)alkoxy diphenyl alkane, or the corresponding dihydroxy compound, to a dienedioic acid ester or dienedioic acid; (d) hydrogenation of the dienedioic acid compound to a benzyl adipic acid derivative; (e) cyclization of said compound to a 2-(2-carbalkoxyethyl)-4-tetralone by means of dehydrating or dehydrohalogenating agents; (f) cyclization of the 4-tetralone derivatives by condensation with a dialkyloxalate to give a 2-carbalkoxy 3,4,10-trioxo-octahydroanthracene; and (g) removal of the 2-substituent by decarboxylation. The intermediates and final products are useful as bactericides and/or chelating agents.

3,697,553

2-(3-INDOLYL)-1(1-IMINOMETHYL)-INDOLINES AND PROCESS FOR THEIR PREPARATION

Yao Hua Wu, and Arthur Jacob Mueller, both of Evansville, Ind., assignors to Mead John & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 709,941, March 4, 1968, abandoned. This application Jan. 19, 1970, Ser. No. 4,108

Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 9 Claims

2-(2- or 3-Indolyl)indolines, unsubstituted and carbon substituted, condense with N-mono substituted carboxamides or with lactams under the influence of phosphorus oxychloride to produce 1-(N-substituted imino-alkyl)-2-(2- or 3-indolyl)indolines. The 2-(3-indolyl)-1-[2-(1-pyrrolinyl)]indolines rearrange to produce benzodiazepine derivatives. These products have diuretic activity on oral administration.

3,697,554

FORMYLAMINOTHIOARYLOXYANTHRAQUINONES

Guido R. Genta, Lock Haven, Pa., assignor to American Aniline Products, Inc.

Continuation-in-part of Ser. No. 582,062, Feb. 17, 1966, abandoned. This application March 25, 1969, Ser. No. 810,363

Int. Cl. C09b *1/56*

U.S. Cl. 260—377 5 Claims

Anthraquinone dyestuffs containing a formylamino groups in the 1-position and a thioaryloxy group, such as a thiophenoxy group, in the 4-, 5-, or 8-position are made by reacting the appropriate 1-aminoanthraquinone with an organosulfonyl halide and dimethylformamide and heating the resulting intermediate in aqueous alkaline solution to form the 1-formylaminoanthraquinone. The products are excellent colors for polyester fibers, ranging from yellow to reddish-orange in shade.

3,697,555

ISOTHIOCYANO-DIPHENYL ETHERS, SULFIDES, SULFOXIDES AND SULFONES

Fritz Paltauf, Graz, Austria; Alfred Margot, and Paul Brenneisen, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 669,653, Sept. 21, 1967, Pat. No. 3,558,784, Continuation of Ser. No. 516,096, Dec. 23, 1965, abandoned. This application Dec. 29, 1969, Ser. No. 888,957

Claims priority, application Switzerland, Dec. 30, 1964, 16868/64; Dec. 30, 1964, 16869/64

Int. Cl. C07c *161/04*

U.S. Cl. 260—397.6 13 Claims

Anthelmintically useful mono- or di-isothiocyano substituted diphenyl ethers, sulfides, sulfoxides and sulfones, the molecule of which must contain either a dialkylamino, or, preferably, one nitro group and which optionally are further substituted by alkyl, alkoxy or chlorine are described; such compounds when applied in anthelmintically effective dosage, are unexpectedly well tolerated by the organism of warm-blooded animals, in contrast to other structurally closely related isothiocyano diphenyl ethers, which are too toxic to be satisfactory anthelmintic agents.

3,697,556

PREPARATION OF 7α-METHYL STEROIDS

Robert Boucourt; Lucien Nedelec, both of Clichy-sous-Bois, and Jean-Claude Gasc, Bondy, all of France, assignors to Roussel UCLAF, Paris, France

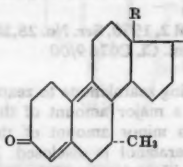
Filed July 27, 1970, Ser. No. 58,668

Claims priority, application France, July 28, 1969, 6925702

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.45 6 Claims

A novel process for the preparation of 7α-methyl-$\Delta^{4,9}$-gonadienes of the formula



I

wherein R is alkyl of one to four carbon atoms and R' is selected from the group consisting of hydrogen, acyl of an or-

ganic carboxylic acid of one to 18 carbon atoms and an organic ether radical, a novel process for preparing the corresponding $\Delta^{4,9,11}$-gonatrienes and novel intermediates produced by the said processes.

3,697,557

PROCESS FOR THE ISOLATION OF ORGANIC HYDRAZO REACTIVE KETONES

Heinz K. Jahnke, Kalamazoo, and Heinz F. MaYer, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 8, 1971, Ser. No. 113,582
Int. Cl. C07c *167/40*, *167/42*
U.S. Cl. 260—397.45 8 Claims

This invention relates to the isolation of organic hydrazo-reactive ketones from a liquid environment containing them by reaction with an insoluble solid material containing available acylhydrazide groups, and includes the subsequent recovery of the ketone from the resulting hydrazone complex and regeneration of the acyl-hydrazide groups; the process being particularly adaptable to the separation of minor quantities of hydrazo-reactive steroid ketones from admixture with other steroids.

3,697,558

PREPARATION OF 17ALPHA-ETHYNYLESTRIOL

Nicholas J. Bach, and Eugene Farkas, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed March 24, 1971, Ser. No. 127,771
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 2 Claims

An improved process for preparing 17α-ethynylestriol utilizing a novel isomer separation process

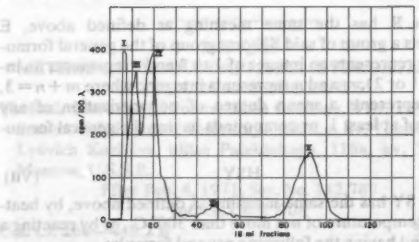
---

3,697,559

1,25-DIHYDROXYCHOLECALCIFEROL

Hector F. De Luca, Madison; Heinrich K. Schnoes, Waunakee, and Michael F. Holick, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 25, 1971, Ser. No. 118,881
Int. Cl. C07c *171/08*
U.S. Cl. 260—397.2 1 Claim



1,25-Dihydroxycholecalciferol. The compound is characterized by antirachitic activity (vitamin D-like activity) and by its high activity in promoting intestinal calcium absorption indicating a more rapid onset of antirachitic activity.

3,697,560

NOVEL COMPOSITION

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed March 29, 1971, Ser. No. 129,216
Int. Cl. C08h *3/00*, *9/02*
U.S. Cl. 260—399 15 Claims

This substituted aliphatic unsaturated esters and derivatives, prepared by the reaction of halide precursor with lower alkylthiol in the presence of base which are useful for the control of insects.

3,697,561

NOVEL SULFUR CONTAINING DI AND TRI UNSATURATED ALIPHATIC CARBONYL COMPOUNDS

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed April 5, 1971, Ser. No. 131,455
Int. Cl. C08h *3/00*, *9/02*
U.S. Cl. 260—399 13 Claims

Novel sulfur containing di- and tri-unsaturated aliphatic carbonyl compounds prepared by ylid reaction or phosphonate carbanion reaction which are useful for the control of insects.

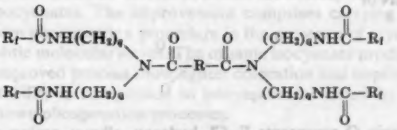
3,697,562

NOVEL FLUOROCARBON DIAMIDES

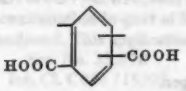
Wilhelmus M. Beyleveld, Whippany; Bryce C. Oxenrider, Florham Park, and Cyril Woolf, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,373
Int. Cl. C07c *103/30*
U.S. Cl. 260—404.5 10 Claims

Novel fluorocarbon diamides useful as oil- and water- repellent agents have the formula



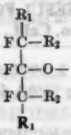
wherein R is a covalent bond, an alkyl diradical of one to 12 carbon atoms, an alkylene diradical of two to 12 carbon atoms, a phenyl diradical having from zero to four chlorine substituents, or a dicarboxy phenyl diradical having the formula



q is an integer from 1 to 6; and R_f is a radical having the formula

$$Y(CF_2)_s(CH_2)_t$$

wherein s is an integer from 1 to 16, t is an integer not greater than s from 0 to 8, with the sum of s plus t being from 1 to 20; and Y is selected from the group consisting of F_3C— and radicals having the formula



wherein R_1 and R_2 are fluorine or perfluoroalkyl groups having from one to nine carbon atoms, with not more than three of the R_1 and R_2 groups being perfluoroalkyl groups.

3,697,563

(3,4,5-TRIMETHOXY-BENZAMIDO)-ALKANOIC ACIDS FOR PROPHYLAXIS AND TREATMENT OF CARDIAC DISORDERS

Aldo Garzia, Lodi, Italy, assignor to Istituto Chemioterapico Italiano S.p.A.

Continuation-in-part of Ser. No. 840,841, July 10, 1969. This application June 29, 1970, Ser. No. 50,949
Int. Cl. C09f *7/00*
U.S. Cl. 260—404 5 Claims

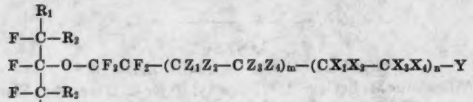
(3,4,5-Trimethoxy-benzamido)-alkanoic acids and their pharmaceutically-acceptable salts for propyhylaxis and treatment of cardiac disorders.

3,697,564
FLUOROCARBON ACIDS AND DERIVATIVES

Louis Gene Anello, Basking Ridge; Richard Francis Sweeney, Randolph Township, Morris County, both of N.J., and Morton Herbert Litt, Cleveland, Ohio, assignors to Allied Chemical Corporation, New York, N.Y.

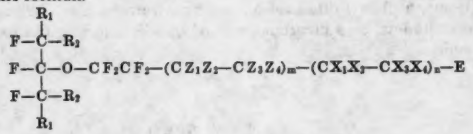
Continuation-in-part of Ser. No. 633,359, April 25, 1967, Pat. No. 3,514,487. This application April 12, 1968, Ser. No. 721,115
Int. Cl. C07c 59/22
U.S. Cl. 260—408 17 Claims

Fluorocarbon compounds of the formula



wherein R_1 and R_2 are F, fluoroalkyl or fluoroalkylene groups forming a cycloaliphatic structure, wherein $-(CZ_1Z_2-CZ_3Z_4)-$ and $-(CX_1X_2-CX_3X_4)-$ are bifunctional groups wherein Z_1-Z_4 and X_1-X_4 are H, F, or Cl, and wherein Y is —CN or

wherein Q represents F, Cl, hydroxy, alkoxy, amino or substituted amino groups are prepared from polyfluorohalides of the formula



wherein E is a halogen.

Carboxylic acids of the present invention and their amides are oil and stain repellent agents. Their salts, esters, halides and nitriles are surfactants and/or intermediates for the preparation of oil and stain repellent agents.

3,697,565
TETRAALKYL SUBSTITUTED UNSATURATED ACIDS AND ESTERS HAVING A TERMINAL QUATERNARY ALKYL GROUP USEFUL FOR INSECT CONTROL

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Feb. 2, 1970, Ser. No. 7,987
Int. Cl. C07c 57/02, 69/52; A01n 9/24
U.S. Cl. 260—408 15 Claims

Aliphatic esters having terminal quaternary alkyl group and di-unsaturation in the backbone prepared by alkylation of allylic acetate useful for insect control.

3,697,566
NOVEL ORGANO-TIN COMPOUNDS

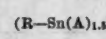
Atsuo Sassa, Tokyo; Masuo Yukutomi, Fuchu-shi; Hirotoshi Shinkawa, Musashino-shi; Tuneo Moriya, Otsu-shi, and Keisuke Homma, Itami-shi, all of Japan, assignors to Kyodo Chemical Company Limited and Sumitoma Bakelite Company Limited, Tokyo, Japan

Filed Nov. 24, 1969, Ser. No. 879,592
Claims priority, application Japan, Nov. 30, 1968, 43/87293; Nov. 30, 1968, 43/87294; Nov. 30, 1968, 43/87295
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 2 Claims

An organo-tin compound is prepared by reacting a compound having the following general formula:

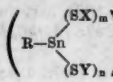
(I)

or



(II)

wherein R represents an alkyl group, alkenyl group or aralkyl group having one to eighteen carbon atoms, A represents a sulfur atom and *l* represents a mean degree of polymerization of any number of at least 2, with a monoorgano-tin compound having the following general formula:

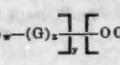


(III)

wherein R has the same meaning as defined above, SX represents a group of mercaptan residue, or a group of the following general formula:

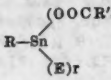
$$-SR'COOR'' \qquad [IV]$$

(wherein R′ represents an alkylene group, cycloalkylene group, alkenylene group and phenylene group having one to eight carbon atoms, R″ represents a hydrogen atom or an alkyl group, cycloalkyl group, alkenyl group or aralkyl group), SY represents a group of said SX or a group of the following general formula:



(V)

(wherein R′ has the same meaning as defined above, G represents an oxygen atom, sulfur atom, carbon atom or a methylidyne group, *w* represents an integer of 1 to 4, *x* represents an integer of 0 or 1, *y* represents an integer of 1 to 8 and *z* represents an integer of 2 to 4) or a group of the following general formula:



(VI)

(wherein R has the same meaning as defined above, E represents a group of said SX or a group of the general formula [V], *q* represents an integer of 1 to 3 and *r* represents an integer of 1 or 2), *m* and *n* represents integers, where $m+n=3$, and *p* represents a mean degree of polymerization of any number of at least 1, or compounds having the general formula:

$$HSY \qquad [VII]$$

wherein SY has the same meaning as defined above, by heating to a temperature of not more than 300° C., or by reacting a compound having the following general formula:

$$R\cdot Sn(X)_3 \qquad [VIII]$$

with compound having the general formula:

$$MSY \qquad [IX]$$

$$MSR'COOM \qquad [X]$$

wherein X represents a halogen atom, M represents an alkali metal, and SY and R′ have the same meanings as defined above, at a temperature of not more than 100° C., and further reacting the resulting compound having the following general formula:

(XI)

wherein R, X and SY have the same meanings as defined above, and *d* and *e* represent integers of 1 or 2, with at least one of caustic alkalis and alkali metal sulfides at a temperature of not more than 100° C.

The organo-tin compound is very excellent as stabilizers for plastic owing to its non-toxicity.

3,697,567

REMOVAL OF DISSOLVED ORGANIC LEAD FROM AQUEOUS ALKYLLEAD PROCESS EFFLUENTS

Earl Richard Taylor, Jr., Antioch, Calif., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed March 24, 1971, Ser. No. 127,844
Int. Cl. C07f 7/24
U.S. Cl. 260—437 R **7 Claims**

Process of removing dissolved organic lead from an aqueous effluent produced in the manufacture of alkyllead compounds by contacting a metal more electropositive than lead but essentially non-reactive with water with the effluent until the dissolved organic lead is converted to an insoluble lead-containing product, leaving a reduced dissolved organic lead content in the effluent.

3,697,568

IMINOXYORGANOSILANES

Jean Boissieras; Louis Ceyzeriat, and Guy Poy, all of Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 12, 1970, Ser. No. 89,149
Claims priority, application France, Nov. 12, 1969, 6938761
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 R **14 Claims**

Silanes R—Si Y_a Q_{3-a} where R is unsubstituted or halo, alkoxy or nitrile substituted hydrocarbon radical, one of Y and Q is —ON=CR'R'' and the other is O(DO)$_n$R''', *a* = a number from 0.1 to 2.9, where R' is a hydrocarbon radical, R'' is H or C_{1-5} alkyl, or R' and R'' together are divalent hydrocarbon radicals, R''' is C_{1-4} aliphatic hydrocarbon radical, D is C_{1-4} alkylene radical and *n*=O, 1, 2 or 3; are prepared by reacting $RSiE_aQ_{3-a}$ with YH where E is halogen or acyloxy. They may be used particularly as cross-linking agents for polydiorganosiloxanes having reactive terminal groups on the chain to give elastomer forming compositions which are storage stable in the absence of water and which cure to form elastomers in the presence of water at about 20° C.

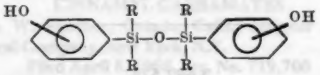
3,697,569

METHOD OF PRODUCING 1,3-BIS (HYDROXYARYL) TET RAORGANOSILOXANES

Vladimir Florovich Mironov, ulitsa Gubkina, 4 kv. 13; Nikolai Semenovich Fedotov, Sosinskaya ulitsa, 6 kv. 7, and Vadim Lvovich Kozlikov, ulitsa Palekhskaya, 118a, kv. 7, all of Moscow, U.S.S.R.

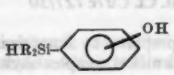
Filed Feb. 4, 1971, Ser. No. 112,787
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 B **5 Claims**

A method of producing 1,3 bis-(hydroxyaryl) tetraorganodisiloxanes of the general formula



where R is alkyl,

consisting in that a diorganohydrosilyl halophenol ester is reacted with magnesium in an organic solvent medium. Then the solvent is distilled off, the reaction mixture is heated to a temperature of 150°–180°C, is treated with a 10–15 percent solution of a mineral acid, thus isolating diorganohydroxilyl-substituted phenols of the general formula



where R is alkyl.

The obtained compounds of the above-mentioned general formula are subjected to hydrolysis in the presence of a catalyst such as powdered copper, powdered nickel, powdered iron, an organic or inorganic base, hydroxide or alcoholate of alkali metals, or are subjected to alcoholysis in the presence of the above-said catalysts followed by hydrolysis. After that condensation of the diorganohydroxysilylphenols is effected under a vacuum at a temperature of 35°–60°C and a residual pressure of 1–2 mm Hg.

The 1,3 bis-(hydroxyaryl) tetraorganodisiloxanes are used for synthesis of polymers having a high terminal stability.

3,697,570

METHOD OF PREPARING ORGANIC ISOCYANATES IN THE PRESENCE OF MOLECULAR SIEVES

Edward J. Thompson, Watertown, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 30, 1969, Ser. No. 846,241
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PH **4 Claims**

An improved process is disclosed for the phosgenation of aliphatic and aromatic amines to obtain the corresponding organic isocyanates. The improvement comprises carrying out the known phosgenation procedure in the presence of crystalline zeolitic molecular sieves. The organic isocyanate products of the improved process show lighter coloration and improved color stability in comparison to isocyanates obtained by the prior known phosgenation processes.

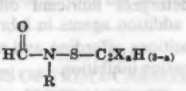
3,697,571

N-POLYHALOVINYLTHIOFORMAMIDES

Melancthon S. Brown, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 810,368, March 25, 1969, abandoned, and a continuation-in-part of Ser. No. 748,642, June 30, 1968, abandoned. This application April 30, 1970, Ser. No. 33,878
Int. Cl. C07c 119/00
U.S. Cl. 260—453 R **5 Claims**

N-polyhalovinylthioformamides of the formula:



wherein R is hydrogen or alkyl of one to four carbon atoms, X is halogen of atomic number 17 to 35 and *a* is 2 or 3. These formamides are fungicidal, algicidal and nematocidal.

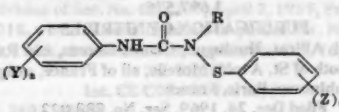
3,697,572

N-ARYL-N'ALKYL-N'ARYLTHIO UREAS AS HERBICIDES

Melancthon S. Brown, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 709,896, Mar. 4, 1968, abandoned, and a continuation-in-part of Ser. No. 3,238, Jan. 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 709,896,. This application May 28, 1970, Ser. No. 41,603
Int. Cl. C07c 119/00
U.S. Cl. 260—453 R **9 Claims**

Ureas of the formula:



where R is alkyl of one to four carbon atoms, Y is halogen of atomic number 9 to 35, i.e., F, Cl and Br, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms or trifluoromethyl, with the proviso that when Y is alkyl or

alkoxy, Y is in position 2, 4 or 6 of the nucleus, *n* is 0 or an integer in the range of 1 and 3 inclusive with the proviso that when *n* is 2 or 3 at least one Y is halogen, 8 is halogen of atomic number 9 to 35 or alkyl of one to about four carbon atoms and *a* is 0, an integer in the range of 1 and 5 inclusive when Z is halogen, or 1 when Z is alkyl. These ureas are herbicidal.

3,697,573
LINEAR ALKYLPHENOL SULFATE-SULFONATE PHOSPHATE-FREE DETERGENT ACTIVES

Mitchell Danzik, Pinole, and Ralph House, El Sobrante, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 5, 1970, Ser. No. 34,885
Int. Cl. C07c *141/00*
U.S. Cl. 260—457 **4 Claims**

Heavy duty detergent active materials capable of heavy duty washing performance in the absence of phosphate builders are provided, the materials comprising alkylphenol sulfate-sulfonate compounds in which the alkyl groups are linear of 16–24 carbon atoms,.

3,697,574
BORON DERIVATIVES OF HIGH MOLECULAR WEIGHT MANNICH CONDENSATION PRODUCTS

Edmund J. Piasek, Chicago, Ill., and Robert E. Karll, Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 502,368, Oct. 22, 1965, Pat. No. 3,539,633. This application April 14, 1969, Ser. No. 816,079
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R **6 Claims**

High molecular weight Mannich condensation products of (1) high molecular weight alkyl-substituted hydroxyaromatic compounds whose alkyl substituent has upward from 40 to 20,000 carbon atoms, (2) an amine which contains an

and (3) an aldehyde in the respective reactant molar ratio of 1 : 0.1–10 : 1.0–10 condensed with a boron compound are novel dispersant-detergent lubricant oil addition agents. Solutions of those addition agents in lubricant oil are novel and unique compositions affording anti-sludge and varnish deposition and corrosion inhibition.

3,697,575
BORIC ACID ESTERS OF 2-VINYLTHIOETHANOL

Herbert Naarmann, Ludwigshafen, and Heinrich Hartmann, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 22, 1969, Ser. No. 887,345
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R **2 Claims**

Boric esters of the formula

$$(CH_2 \quad CH—S—CH_2—CH_2O)_n B(OR)_{3-n}$$

where R represents an alkyl radical, optionally substituted, and *n* is equal to 1, 2 or 3. The products are used as flameproofing agents for plastics materials and resins.

3,697,576
PURIFICATION OF NITRILES

Rene Joseph Allirot, Huningue; Claude Darcas, and Raymond Jobert, both of St. Avold, Moselle, all of France, assignors to Ugine Kuhlmann, Paris, France

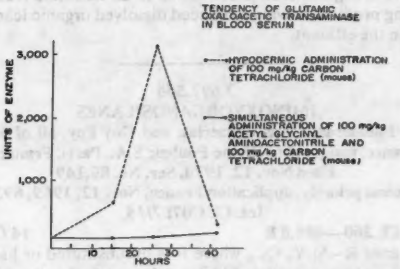
Filed Dec. 24, 1969, Ser. No. 888,022
Int. Cl. C07c *121/32, 121/00*
U.S. Cl. 260—465.3 **8 Claims**

Procedure for the removal of nitrogeneous bases such as oxazole from partially purified nitrile compositions obtained by vapor phase catalytic reaction between ethylenic hydrocarbons, ammonia and oxygen in which the nitrogeneous base is removed by adsorption on alumina, decolorizing clays, or silica.

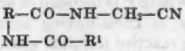
3,697,577
DERIVATIVES OF N(N-ACYL AMINO ACYL) AMINOACETONITRILE

Tsutomu Irikura; Keigo Nishino; Seigo Suzue; Keichi Ushiyama, all of Tokyo, and Hirotaka Shinada, Saitama-ken, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1969, Ser. No. 828,508
Claims priority, application Japan, April 22, 1964, 39/22575
Int. Cl. C07c *121/44, 103/30*
U.S. Cl. 260—465.4 **15 Claims**



N-(N-acylaminoacyl)-aminoacetonitriles of the formula



in which

is the radical of

representing an amino acid selected from the group consisting of glycine, α-alanine, β-alanine, α-aminoisobutyric acid, valine, methionine, lysine, aspartic acid, and δ-aminovaleric acid and R^1CO represents an acyl radical, R^1 representing a member selected from the group consisting of straight and branched chain alkyl radicals having from one to four carbon atoms.

3,697,578
PROCESS FOR PREPARING 3-PENTENE NITRILE

Pietro Pasquino, Vercelli; Luigi Benzoni, Novara; Giuseppe Carnisio, Galliate, and Luigi Colombo, Arona, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Dec. 16, 1970, Ser. No. 98,908
Claims priority, application Italy, Dec. 17, 1969, 25901 A/69
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **3 Claims**

3-pentene-nitrile is prepared by isomerization of 2-methyl-3-butene-nitrile, using a nickel complex as catalyst.

3,697,579

METHOD OF ESTERIFYING A POLYCARBOXYLIC ACID WITH A GLYCOL

Laszlo J. Balint, Chester; Stanley D. Lazarus, Petersburg, and William N. Russell, Colonial Heights, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 812,350, April 1, 1969, abandoned. This application Sept. 18, 1969, Ser. No. 859,054. The portion of the term of this patent subsequent to Sept. 5, 1989, has been disclaimed.

Int. Cl. C07c 69/82

U.S. Cl. 260—468 R 9 Claims

The esterification of a polycarboxylic acid with a polyol is described under conditions of direct esterification and wherein the reacting mass is a flowable, uniform dispersion of (1) a paste of the said polycarboxylic acid and the said polyol, and (2) at least 3 parts by weight per part paste of a partially esterified product of said polycarboxylic acid with said polyol.

3,697,580

PRODUCTION OF BUTEN-2-OL-4 COMPOUNDS

Hermann Overwien, Ludwigshafen, and Herbert Mueller, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine Germany

Filed Jan. 9, 1970, Ser. No. 1,889

Claims priority, application Germany, Jan. 15, 1969, P 19 01 709.5

Int. Cl. C07c 43/14, 47/26, 67/00

U.S. Cl. 260—468 R 7 Claims

Production of buten-2-ol-4 compounds by isomerization of buten-1-ol-4 compounds in the presence of palladium or a compound thereof and hydrogen. The products are solvents or starting materials for the production of solvents, dyes, surface coatings and pest control agents.

3,697,581

5-CYCLOALKYLIDENE DIBENZOCYCLOHEPTENE DERIVATIVES

Leslie G. Humber, Dollard Des Ormeaux, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed May 18, 1970, Ser. No. 38,571

Int. Cl. C07c 69/14, 69/16, 39/12

U.S. Cl. 260—479 R 4 Claims

There are disclosed new derivatives of 5-cyclohexylidene-5H-dibenzo[a,d]cycloheptene which are substituted at either position 2 or at both positions 2 and 8 with hydroxyl, lower acyloxy, or an aminoethoxy radical, such as, diethylaminoethoxy, dimethylaminoethoxy, pyrrolidinoethoxy, piperidinoethoxy or morpholinoethoxy, as well as the acid addition salts with pharmaceutically acceptable acids of those derivatives containing the aminoethoxy radicals. The derivatives are useful as antigonadotrophic agents substantially free from estrogenic effects, and methods for their preparation and use are given.

3,697,582

CINNAMYL CARBAMATES

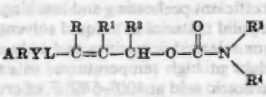
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed April 8, 1968, Ser. No. 719,700

Int. Cl. C07c 25/06

U.S. Cl. 260—482 C 21 Claims

Compounds correspond to the formula



wherein ARYL is phenyl, substituted phenyl, naphthyl and substituted naphthyl in which said substituents are halogen, lower alkoxy, lower alkyl, or when ARYL is substituted phenyl the substituent is also 3,4-oriented-methylenedioxy;

R and R^1 are independently hydrogen, lower alkyl, chlorine or bromine; R^2 is hydrogen, lower alkyl, or phenyl; and R^3 and R^4 are independently hydrogen, alkyl, lower alkenyl, carbethoxymethyl, phenyl and substituted phenyl in which said substituents are selected from the group halogen, lower alkoxy, lower alkyl and nitro, provided that only one of R^3 or R^4 is phenyl or substituted phenyl. The above-defined compounds are effective herbicides. Representative compounds are: cinnamyl-N-methylcarbamate; 2-chlorocinnamyl-N-methylcarbamate; cinnamyl-N-allylcarbamate; cinnamyl carbamate; o-bromocinnamyl-N-methyl carbamate.

3,697,583

PROCESS FOR PRODUCING ACRYLIC ACID ESTERS

Theodor Volker, and Klaus Hering, both of Fribourg, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Basel, Switzerland

Filed March 30, 1970, Ser. No. 29,334

Claims priority, application Switzerland, March 31, 1969, 4825/69

Int. Cl. C07c 69/54

U.S. Cl. 260—486 R 7 Claims

A process for producing acrylic acid esters by reacting maleic acid anhydride with an alcohol component consisting of at least one aliphatic alcohol having one to four carbon atoms to give the corresponding maleic acid half ester, and decarboxylating the half ester in the presence of a copper compound, especially cupric oxide, and of a compound containing a tertiary nitrogen atom in a ring of the pyridine type, is carried out in advantageous manner when the molar ratio (X) of the alcohol component to maleic acid anhydride is governed by the equation

$$x = 98/m - M$$

wherein m is a number from 92 to 106, and M is the molecular weight of the alcohol forming the alcohol component, or if the alcohol component consists of at least two alcohols, M is the arithmetic mean of the molecular weights of the alcohols, corresponding to the molar ratio of the alcohols.

3,697,584

PYROLYSIS OF TRIS(2-CARBOXYETHYL)-ISOCYANURATE

Edwin D. Little, Convent Station, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,649

Int. Cl. C07c 57/04, 69/54

U.S. Cl. 260—486 R 11 Claims

Tris(2-carboxyethyl)isocyanurate and esters, amides, anhydrides and acid halides thereof undergo pyrolysis to afford cyanuric acid and acrylic acid or the corresponding ester, amide, anhydride or acid halide thereof. The process provides an in situ source of acrylate derivatives.

3,697,585

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J.; John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 635,287, April 7, 1967, Pat. No. 3,557,218, which is a continuation-in-part of Ser. No. 499,064, Oct. 20, 1965, abandoned. This application Oct. 16, 1970, Ser. No. 81,607

Int. Cl. C07c 69/14, 69/16

U.S. Cl. 260—488 B 2 Claims

Photochromic 1,3,6,8-tetra(lower)alkyl-15,16-dimethyl-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl-15,16-methylene-15,16-

dihydropyrenes substituted in one or both of the 2- and 7-positions benzoyl, alkanoyl, alkanoyloxy, cyano, nitro, alkyl, α-hydroxy-alkyl, α-acyloxyalkyl, α-isonitrosoalkyl, or acylamido groups are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-acetamido-7-nitro-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene.

3,697,586

PRODUCTION OF VINYL ACETATE FROM ETHYLENE USING NOVEL LIQUID CATALYST COMPOSITIONS

John D. Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 795,039, Jan. 29, 1969. This application Jan. 19, 1971, Ser. No. 107,840

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A **2 Claims**

A cyclic method for producing vinyl acetate wherein a novel catalyst composition containing acetic acid, up to 20 weight percent water, a palladium compound catalyst, and salts to provide: copper, chromic (+3) and potassium cations, and acetate and chloride anions is reacted with ethylene in a first stage to produce vinyl acetate and form cuprous copper which is reoxidized to the cupric state by reacting the catalyst composition with molecular oxygen in a second stage before the catalyst composition is recycled for re-use in the first stage.

3,697,587

PROCESS AND COMPOUNDS

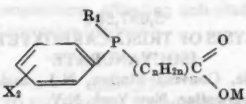
Hill M. Priestley, North Bergen, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 579,211, Sept. 14, 1966, Pat. No. 3,467,717, which is a continuation-in-part of Ser. No. 329,386, Dec. 10, 1963, Pat. No. 3,331,878. This application June 30, 1969, Ser. No. 837,863

Int. Cl. C07c *63/00*

U.S. Cl. 260—501.19 **11 Claims**

A group of novel alkali metal and ammonium soaps formed from intermediate phosphine oxides is disclosed having the generic formula:



wherein R_1 is an acyclic aliphatic hydrocarbon radical having from eight to 18 carbon atoms, n is an integer from 0 to 2, X_2 is a member of the group consisting of H and alkyl having one to 14 carbon atoms, and M is a water-solubilizing cation.

3,697,588

CYCLOHEXENYL ACETIC ACID COMPOUNDS

Michel Vincent, Bagneux; Georges Remond, Paris, and Jean-Claude Poignant, Wissous, all of France, assignors to Societe en nom collectif Science Union et Cie. Societe Francaise de Recherche Medicale-Suresnes

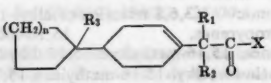
Filed Nov. 3, 1969, Ser. No. 873,659

Claims priority, application Great Britain, Nov. 13, 1968, 53,864/68

Int. Cl. C07c *61/28*, *103/19*, *83/08*

U.S. Cl. 260—514 R **3 Claims**

Cyclohexenyl acetic acid compounds of the formula



wherein

R_1, R_2 and R_3 are hydrogen or lower alkyl;

n is 1 to 4; and

X is hydroxyl, amino, alkylamino or hydroxylamino.

These compounds possess analgesic and antiinflammatory properties.

3,697,589

N-(4-CARBOXY-BENZYLIDENE)AMINES

Raphael Menasse, and Karl Gatzi, both of Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Division of Ser. No. 708,807, Feb. 28, 1968, which is a division of Ser. No. 512,811, Dec. 9, 1965, abandoned. This application Oct. 12, 1970, Ser. No. 80,147

Int. Cl. C07c *101/42*

U.S. Cl. 260—518 R **2 Claims**

N-benzylidene alkylamines in which the alkyl group has from eight to 18 carbon atoms, and in which the phenyl moiety is optionally substituted, are fungicidal agents. Compositions containing these compounds are fungicides and methods for combatting fungi use these compounds.

3,697,590

PHENYLACETIC ACIDS AND THEIR SALTS

Jacques R. Boissier, Paris, and Roger Ratouis, Saint-Cloud, both of France, assignors to Societe anonyme dite: Roussel-UCLAF, Paris, France

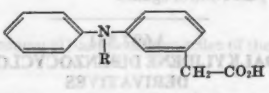
Filed July 28, 1969, Ser. No. 848,141

Claims priority, application France, July 30, 1968, 68161159; Oct. 24, 1968, 68171217

Int. Cl. C07c *101/44*

U.S. Cl. 260—518 R **3 Claims**

Phenylacetic acid derivatives having the formula:

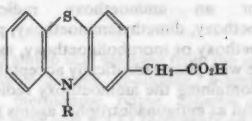


(1)

where R represents an hydrogen or a methyl radical.

Compounds of formula (1) and their metallic and amine salts are very useful substances in human therapeutics, namely as analgesic, antipyretic and antiinflamatory medicines.

Compounds of formula (1) are prepared by reacting a 2-phenothiazinylacetic acid of formula:



(2)

with a desulfurizing reducing agent.

3,697,591

TURBULENT FLOW LEACHING

John Nasser, New Canaan, Conn., assignor to Mobil Oil Corporation

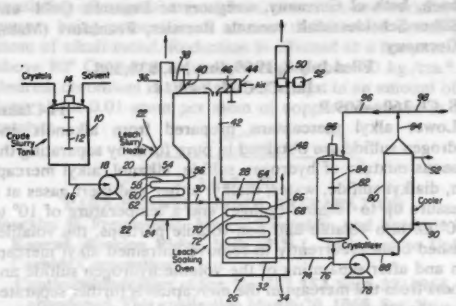
Filed Sept. 1, 1966, Ser. No. 576,764

Int. Cl. C07c *63/26*

U.S. Cl. 260—525 **10 Claims**

Rapid and efficient preheating and leaching of a suspension of an impure solid material in a liquid solvent capable of dissolving free or released impurities and only a portion of the desired product at high temperatures, as exemplified by a suspension in acetic acid at 400°–580° F. of crude terephthalic acid contaminated with p-carboxybenzaldehyde and p-toluic acid, while maintaining turbulent flow in pipes to prevent the settling or plating of solid deposits therein. Disposing the pip-

ing horizontally or at an angle less than the angle of repose of the solid material permits the leaching system to be shut down



and started up without plugging and without cleaning the piping.

3,697,592

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J.; John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 635,287, April 7, 1967, Pat. No. 3,557,218, which is a continuation-in-part of Ser. No. 499,064, Oct. 20, 1965, Pat. No. 3,476,747. This application Oct. 16, 1970, Ser. No. 81,581

Int. Cl. C07c *103/34*

U.S. Cl. 260—562 R **1 Claim**

Photochromic 1,3,6,8-tetra(lower)alkyl-15,16-dimethyl-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl-15,16-methylene-15,16-dihydropyrenes substituted in one or both of the 2- and 7-positions benzoyl, alkanoyl, alkanoyloxy, cyano, nitro, alkyl, α-hydroxy-alkyl, α-acyloxyalkyl, α-isonitrosoalkyl, or acylamido groups are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-acetamido-7-nitro-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene.

3,697,593

2-AMINOMETHYL-2-ADAMANTANOL

Gilbert H. Berezin, West Chester, Pa., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 846,620, July 31, 1969, abandoned, which is a continuation-in-part of Ser. No. 758,631, Sept. 9, 1968, abandoned. This application Feb. 9, 1971, Ser. No. 114,087

Int. Cl. C07c *87/40*

U.S. Cl. 260—563 P **1 Claim**

2-Aminomethyl-2-adamantanol, useful as an intermediate in the preparation of antiviral 4-amino- and 4-amino-methyltricyclo[4.3.1.1^{3,8} undecanes, can be prepared from 2-methylene adamantane by reaction with m-chloroperbenzoic acid to provide spiro[oxirane-2,2'-tricyclo(3.3.1.1^{3,7})]-decane, followed by reaction of the latter compound with ammonia. It can also be prepared by reacting adamantanone with hydrocyanic acid and reducing the resulting adamantane cyanohydrin with lithium aluminum hydride, or by reacting adamantanone with nitromethane and reducing the resulting 2-nitromethyl-2-adamantanol with hydrogen.

3,697,594

CERTAIN SUBSTITUTED CYCLOHEXYL AMINES

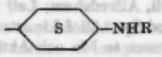
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,304, April 20, 1967, which is a continuation-in-part of Ser. Nos. 574,499, Aug. 8, 1966, Ser. No. 574,276, Aug. 18, 1966. This application May 17, 1968, Ser. No. 730,198

Int. Cl. C07c *87/34, 87/40*

U.S. Cl. 260—563 R **10 Claims**

The invention relates to cis cyclohexyl derivations of the formula R_2CH_2



wherein R is hydrogen, methyl or ethyl and R_2 is alkyl (C_2 to C_8), Cycloalkyl (C_4 to C_9), bicycloalkyl (C_7 to C_{10}) or tricycloalkyl (C_{10} to C_{11}). These compounds are used as intermediates in preparing N-acylcyclohexylamines, having utility as animal repellants.

3,697,595

CONJUGATED NITRO AMINES

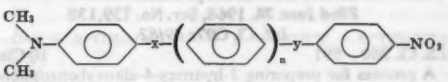
Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 31, 1970, Ser. No. 24,401

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R **4 Claims**

Conjugated nitro amines having the formula:



wherein

x is N N, N CH, CH CH—CH N, or CH CH,
y is CH CH, CH N, N CH—CH CH, or NH and
n is 0, 1 or 2

have been prepared and found useful as dichroic photoconductors.

3,697,596

PRODUCTION OF ARYL-α-OXIMINOALKYLKETONES

Alfons Dorlars, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 5, 1968, Ser. No. 750,250

Int. Cl. C07c *131/00*

U.S. Cl. 260—465 E **9 Claims**

Aromatic-alkyl ketones are reacted with from 0.1 to 50 mol percent of an alkyl nitrite to form the corresponding aryl-α-oximinoketone which is then extracted from the reaction mixture and recovered. Consumed ketone can then be replenished and again reacted with alkyl nitrite.

3,697,597

PROCESS FOR THE PREPARATION OF α-OXIMINOALKYL KETONES

Alfons Dorlars, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 15, 1969, Ser. No. 857,970

Claims priority, application Germany, Sept. 21, 1968, P 17 93 468.8The portion of the term of this patent subsequent to Dec. 29, 1987, has been disclaimed.

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 A **9 Claims**

α-Oximino ketones, for example, oximinodipropyl ketone, are prepared by reacting a ketone in an inert organic solvent immiscible with water in the presence of a hydrogen halide with an amount of alkyl nitrite that is insufficient for complete

nitrosation followed by extracting the ketone formed with an aqueous alkali solution, removing the alkaline extract formed and isolating the α-oximino ketone. The ketones formed are useful as intermediates in the synthesis of pharmaceutical compounds, dyes, analytical reagents, plant protection agents, and optical brighteners.

3,697,598

CONTINUOUS PROCESS FOR PREPARING MONOALKANOLAMINES FROM AMMONIA AND ALKYLENE OXIDES

Bengt J. G. Weibull, Alfredshem; Leif Urban Folke Thorsell, Ornskoldsvik, and Sven-Olof Lindstrom, Domsjoverken, all of Sweden, assignors to Mo och Aktiebolag, Ornskoldsvik, Sweden

Filed Aug. 20, 1968, Ser. No. 754,045
Int. Cl. C07c *89/02*
U.S. Cl. 260—584 9 Claims

A continuous process is provided for preparing monoalkanolamines from ammonia and alkylene oxides using a cation exchange resin as a catalyst, recovering and recycling ammonia, which is used in considerable excess. High yields of the monoalkanolamines, exceeding 65 percent and even 90 percent, are obtainable.

3,697,599

PROCESS FOR PREPARING 2-HYDROXY-4-ALKOXYBENZOPHENONE

Theodore E. Dalbey, Monroeville, Pa., assignor to Pennsylvania Industrial Chemical Corporation

Filed June 24, 1968, Ser. No. 739,138
Int. Cl. C07c *49/82*
U.S. Cl. 260—591 10 Claims

A process for preparing 2-hydroxy-4-alkoxybenzophenone by alkylating 2,4 dihydroxybenzophenone with an alkyl halide in an aqueous solution of an alkali metal hydroxide in the presence of a surfactant.

3,697,600

PREPARATION OF A KETONE AND AN ALDEHYDE, BY CARBONYLATION OF AN OLEFIN IN THE PRESENCE OF A SECONDARY ALCOHOL

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 10, 1969, Ser. No. 865,490
Int. Cl. C07c *45/00*
U.S. Cl. 260—593 R 10 Claims

The invention comprises a preparation of a ketone and an aldehyde by contacting a hydrocarbon olefin, carbon monoxide and a secondary alcohol with a liquid reaction medium and in the presence of a Group VIII noble metal, preferably under basic conditions. A typical reaction comprises contacting ethylene, carbon monoxide and isopropyl alcohol with a reaction medium comprising rhodium trichloride to produce acetone and propionaldehyde.

3,697,601

PROCESS FOR PREPARING 4-ARYLTHIO-2,6-DIALKYLPHENOLS

Tamotsu Fujisawa, and Takakazu Kojima, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Oct. 30, 1970, Ser. No. 85,724
Claims priority, application Japan, Nov. 12, 1969, 44/90074
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F 5 Claims

A new process for the production of 4-arylthio-2,6-dialkylphenols is described. 2,6-Dialkylphenol reacts with an aromatic disulfide in the presence of an alkali hydroxide or alkali metal in a solvent under heating. The process yields 4-arylthio-2,6-dialkylphenols, which are useful economically as an antioxidant in a high yield.

3,697,602

PROCESS FOR THE PRODUCTION OF LOWER ALIPHATIC MERCAPTANS

Gerd Schreyer, Grossauheim, and Wolfgang Weigert, Offenbach, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed July 2, 1969, Ser. No. 838,398
Int. Cl. C07c *149/14*
U.S. Cl. 260—609 R 11 Claims

Lower alkyl mercaptans prepared from alkanols and hydrogen sulfide are obtained in pure form by separating the gaseous mixture of hydrogen sulfide, alkanol, alkyl mercaptan, dialkyl sulfide, water, dialkyl either and inert gases at a pressure up to 10 atm. (gauge) and a temperature of 10° to 140° C. into volatile and non-volatile portions, the volatiles washed countercurrently to remove entrained alkyl mercaptan and after separating of the volatile hydrogen sulfide and ethers from the mercaptan the mercaptan is further separated from the other non-volatiles as a substantially pure product.

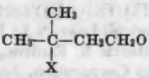
3,697,603

NOVEL PROCESS FOR PREPARING A HALOETHER

John O. Turner, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed March 22, 1971, Ser. No. 127,042
Int. Cl. C07c *43/00*
U.S. Cl. 260—614 A 4 Claims

The haloether, 3-halo-3-methylbutyl methyl ether, of the formula



can be prepared when methylal is reacted with isobutylene in the presence of BX_3, wherein X is chloro, bromo or iodo. This haloether can be converted to isoprene by known pyrolysis methods.

3,697,604

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J.; John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 635,287, April 7, 1967, Pat. No. 3,557,218, which is a continuation-in-part of Ser. No. 499,064, Oct. 20, 1965, abandoned. This application Oct. 16, 1970, Ser. No. 81,608
Int. Cl. C07c *35/22*; G03f *5/00*; F21v *9/00*
U.S. Cl. 260—618 F 1 Claim

Photochromic 1,3,6,8-tetra(lower)alkyl-15,16-dimethyl-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes, 15,16-methylene-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl-15,16-methylene-15,16-dihydropyrenes substituted in one or both of the 2- and 7-positions benzoyl, alkanoyl, alkanoyloxy, cyano, nitro, alkyl, α-hydroxyalkyl, α-acyloxyalkyl, α-isonitrosoalkyl, or acylamido groups are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-acetamido-7-nitro-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene.

3,697,605

PROCESS FOR PRODUCING ALCOHOLS

Masami Watanabe, Tokyo; Keishi Namikawa, Ageo; Kotaro Yasuda, and Motoyoshi Takagi, both of Toda, all of Japan, assignors to Nippon Mining Co., Ltd.

Filed April 19, 1968, Ser. No. 722,575
Claims priority, application Japan, April 22, 1967, 42/25419
Int. Cl. C07c *33/00, 29/00*
U.S. Cl. 260—618 H 1 Claim

A process for the reduction of esters of aromatic carboxylic acids with hydrogen in the presence of a copper-containing

catalyst to the corresponding aromatic alchols is provided wherein the copper-containing catalyst is composed of copper oxide and oxides or carbonates or oxide-carbonate mixtures of one or more alkaline earth metals selected from the group consisting of magnesium, calcium, strontium and barium, the copper being present in an amount of 0.01 to 3 atoms per atom of alkali metal. Reduction is effected at a temperature above 80° C. and at a pressure higher than 60 kg./cm.². If desired, chromium is added to the catalyst in an amount of at least about 0.01 atom per atom of copper contained in the catalyst.

3,697,606

PARA-PHENYLPHENOL PREPARATION

Joachim E. Freudewald, Morris Township, and Frederic M. Konrad, Basking Ridge, both of N.J., assignors to Union Carbide Corporation

Continuation-in-part of Ser. No. 581,153, Sept. 22, 1966, abandoned. This application March 20, 1968, Ser. No. 714,410

Int. Cl. C07c *39/12*

U.S. Cl. 260—620 **9 Claims**

The process of preparing para-phenylphenol by heating para-hexenylphenol in the liquid phase in the presence of a stoichiometric excess of a hydrogen acceptor, and a palladium, nickel or platinum catalyst.

3,697,607

BROMINATED ADDUCTS OF ACYCLIC TRIENES

Carlos G. Cardenas, Jacksonville, Fla., and Donnie G. Brady, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Jan. 2, 1970, Ser. No. 416

Int. Cl. C07c *17/04, 23/08*

U.S. Cl. 260—648 C **9 Claims**

Novel brominated adducts of acyclic trienes with halocyclopentadienes and with substituted halocyclopentadienes are disclosed. Methods of preparing said novel compounds are also disclosed.

3,697,608

DECHLORINATION PROCESS

Harold Edward Bellis, North Tonawanda, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1968, Ser. No. 764,642

Int. Cl. C07c *21/18*

U.S. Cl. 260—653.5 **11 Claims**

A dechlorination process which comprises contacting halogenated hydrocarbons with a melt comprising iron chloride and/or copper chloride, and alkali metal chloride(s). This process utilizes a reduced melt, i.e., a melt containing ferrous and/or cuprous chlorides, to dechlorinate; various process parameters are controlled to provide desired product selectivity. In addition, the dechlorination process may be carried out simultaneously with chlorination or dehydrochlorination reactions.

3,697,609

METHOD OF PRODUCING 2-CHLOROBUTADIENE-1,3

Ichiro Fukuoka; Shoji Kimura; Takehiko Nishimura, all of Tokyo, and Satoshi Takahashi, Hatano, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1968, Ser. No. 727,145

Claims priority, application Japan, May 19, 1967, 42/31470; April 11, 1968, 43/23710

Int. Cl. C07c *21/20*

U.S. Cl. 260—655 **12 Claims**

Production of chloroprene by treating 3,4-dichlorobutene-1 with an anion exchange resin to effect dehydrochlorination of 3,4-dichlorobutene-1. Furthermore, chloroprene can be produced by treating a mixture of 3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 with an anion exchange resin, whereby 3,4-dichlorobutene-1 is dehydrochlorinated preferentially.

3,697,610

PRODUCTION OF CARBON TETRACHLORIDE

James O. Blackwood, Hawthorn, and Brian D. Cullis, Blackburn, both of Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia

Filed April 22, 1970, Ser. No. 30,992

Int. Cl. C07c *19/06*

U.S. Cl. 260—664 **6 Claims**

Carbon tetrachloride is produced by the direct reaction of chlorine and activated carbon at temperatures above 500° C and pressures above 5 atmospheres absolute. No catalyst is used. Activity of the carbon is enhanced by mixing air with the chlorine or by alternate treatment of the carbon with air and chlorine.

3,697,611

OLEFIN-ALKYL IODIDE EXCHANGE

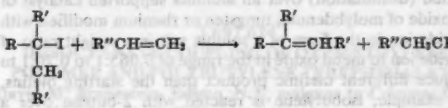
Eugene F. Magoon, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 14, 1970, Ser. No. 72,162

Int. Cl. C07c *11/12*

U.S. Cl. 260—677 XA **6 Claims**

Higher olefins are prepared by an exchange reaction between lower olefins and higher organic iodides according to equation I:



(I)

in the presence of a noble metal catalyst. For example, octene, cyclohexene and decene are produced by an exchange reaction between the corresponding iodides and ethylene in the presence of platinum on various supports, chloroplatinic acid, tris(triphenylphosphine)platinum or bis(triphenylphosphine)ruthenium tricarbonyl.

3,697,612

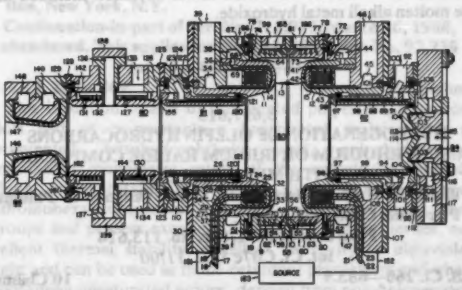
PRODUCTION OF ACETYLENE WITH AN ARC HEATER

Daniel A. Maniero, Pittsburgh, and Charles B. Wolf, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 527,787, Feb. 16, 1966, Pat. No. 3,522,015. This application Oct. 24, 1969, Ser. No. 870,472

Int. Cl. C07c *11/24*

U.S. Cl. 260—679 R **3 Claims**



In the processes, an electric arc is produced in a confined area between two annular electrodes and caused by magnetic

field generated forces exerted thereon to describe a generally axially extending annular path as it moves substantially continuously around and between the electrodes. Process gas is admitted into the confined area through a substantially circumferential path radially external to the electrodes from which the process gas passes in a generally radial direction through the gap between electrodes and through the annular path described by arc movement, is pyrolized, and moves downstream toward an exhaust nozzle separated from the arc zone by elongated fluid-cooled heat shields and so distant from the arc zone that, according to one process, process gas pyrolized at a predetermined temperature has a mass flow rate such that the gas is cooled to a temperature at which the desired recombination product is present in substantial proportion when it reaches the nozzle. In other processes, quenching gas different from the process gas is added to the pyrolized process gas at one or more axial positions along the path of movement of the pyrolized process gas. In other methods, additional process gas is added to the pyrolized process gas at one or more axially spaced positions along the length of the confined area.

3,697,613

DISMUTATION OF OLEFINS

Robert P. Arganbright, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed April 28, 1969, Ser. No. 819,945
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **25 Claims**

Isobutylene and a second C_3 –C_{20} monoolefin can be reacted (dismutation) over an alumina supported catalyst of the oxide of molybdenum, tungsten or rhenium modified with fluoride ion in the form of a soluble salt in a weight ratio of fluoride ion to metal oxide in the range of 0.065:1 to 0.20:1 to produce different olefinic product than the starting olefins. For example, isobutylene is reacted with 2-butene over a MoO_3, NaF (F^-:MoO_3 ratio 0.175:1) at 150° C. to give 30 percent conversion of isobutylene aNd 15 percent selectivity to 2-methyl-2-butene which is the immediate precursor of isoprene (widely used in the preparation of synthetic rubber).

3,697,614

CATALYTIC OXIDATIVE DEHYDROGENATION OF PARAFFINS

Edward S. J. Tomezsko, Media, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed March 16, 1971, Ser. No. 124,979
Int. Cl. C07c *5/18*
U.S. Cl. 260—683.3 **7 Claims**

Method for the oxidative dehydrogenation of paraffins to produce olefins by contacting the paraffins with molecular oxygen in the presence of molten alkali metal hydroxides, aluminum, and a soluble transition metal oxyanion included in the molten alkali metal hydroxide.

3,697,615

HYDROGENATION OF OLEFIN HYDROCARBONS USING RHODIUM OR IRIDIUM HALIDE COMPLEXES WITH METAL HALIDES

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 8, 1971, Ser. No. 113,614
Int. Cl. C07c *5/02*, *11/00*
U.S. Cl. 260—683.9 **10 Claims**

Olefin hydrocarbons are hydrogenated by contacting the feed olefin hydrocarbon with a catalyst which is an admixture of a rhodium or an iridium halide complex and an aluminum or boron halide.

3,697,616

SELECTIVE ISOMERIZATION OF 1-OLEFINS TO 2-OLEFINS

John M. McDonough, 8004 South Menard, Oak Lawn, Ill., and Linsley S. Gray, Jr., 3948 Forest Avenue, Downers Grove, Ill.

Filed March 1, 1971, Ser. No. 119,917
Int. Cl. C07c *5/24*
U.S. Cl. 260—683.2 **12 Claims**

A process for the selective isomerization of 1-olefins to 2-olefins comprising the contacting of a 1-olefin with a sodium coated, calcium metal aluminosilicate molecular sieve catalyst at temperatures of about the freezing point of the 1-olefin being isomerized to about 150° C.

3,697,617

OLIGOMERIZATION PROCESS

Jin Sun Yoo, South Holland, and Ronald L. Milam, Hazel Crest, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 25, 1969, Ser. No. 852,911
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D **16 Claims**

A catalyst composition for the polymerization, including oligomerization and dimerization, of olefins is provided by combining (A) a nickel source, (B) a chloro-containing electron donor ligand, and (C) a Lewis acid-reducing agent, in molar ratios of (B) to (A) of about 0.5 to 15:1 and (C) to (A) of about 3 to 40:1. Preferred catalyst components are nickel acetylacetonate, chlorodiphenylphosphine and ethylaluminum sesquichloride. These catalyst compositions are supported on an acidic-silica base carrier.

3,697,618

PRESSURE-SENSITIVE ADHESIVE

Valentine J. Grunewalder, Cranford, and Earl A. Koeble, Martinsville, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 623,569, March 16, 1967, abandoned. This application Dec. 30, 1969, Ser. No. 889,292
Int. Cl. C08f *15/40*
U.S. Cl. 260—78.5 R **10 Claims**

Acrylic pressure-sensitive adhesives consisting essentially of a normally tacky interpolymer of one or more alkyl acrylates of four to 14 carbon atoms in the alkyl group, at least one vinyl ester of a saturated monocarboxylic acid, and a small amount of alpha, beta-ethylenically unsaturated dicarboxylic acid or anhydride, the interpolymer having a Williams plasticity number between about 1.8 and about 3. These adhesives are especially adapted for use on flexible non-fibrous backings, particularly vinyl sheets and films, and when used in this manner have the advantage of preventing shrinking of the backing upon aging.

3,697,619

A COATING COMPOSITION OF A COPOLYMER OF METHYL METHACRYLATE WITH THE POLYMERIZABLE ADDITION REACTION PRODUCT OF AN α,β-ETHYLENICALLY UNSATURATED ACID AND AN EPOXY COMPOUND

Nobuyoshi Nagata, 177 Gakuen-Daiwacho-4-chome, Nara-shi, and Ryuzo Mizuguchi, 1736 Mashita-Shimokama Mishimacho, Osaka, both of Japan

Continuation-in-part of Ser. No. 653,321, July 14, 1967, abandoned. This application Dec. 18, 1969, Ser. No. 886,419
Int. Cl. C09d *3/80*
U.S. Cl. 260—836 **7 Claims**

A liquid coating composition is formed by copolymerizing without gelation, 50–95 parts by weight of a methyl methacrylate lacquer-giving monomer component and 5–50 parts by weight of a polymerizable addition reaction product obtained by the addition reaction of an α,β-ethylenically unsaturated

acid and an epoxy compound. In those instances where a polyepoxy compound (e.g., diepoxide) is used, the addition reaction is controlled to the extent that a sufficient amount of monoester and an insufficient amount of diester are formed so that substantially no gelatin occurs during copolymerization and/or formation of the coating composition. Films are formed from the coating composition which exhibit excellent durability, impact resistance, shrink resistance, and gasoline resistance.

3,697,620

VULCANIZABLE ELASTOMER COMPOSITION CONTAINING TRIARYLPHOSPHINE AND TRIALLYLCYANURATE

Nicholas Peter Ermidis, West New York, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed April 22, 1970, Ser. No. 31,011

Int. Cl. C08f *15/18, 15/26*

U.S. Cl. 260—836 **9 Claims**

A vulcanizable composition having improved processing safety, as well as an improved resistance to heat aging, is provided which comprises an acrylic elastomer having active halogen or epoxy groups and a triarylphosphine and triallylcyanurate.

3,697,621

CHEMICALLY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 49,207, June 23, 1970, Pat. No. 3,662,023, which is a continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application June 25, 1971, Ser. No. 156,967

Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*

U.S. Cl. 260—858 **14 Claims**

The invention disclosed is for a new chemically curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The chemically curable liquid polymer composition upon curing in the presence of a chemical free radical generating reagent forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,697,622

CHEMICALLY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 49,207, June 23, 1970, which is a continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application June 25, 1971, Ser. No. 156,977

Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*

U.S. Cl. 260—858 **14 Claims**

The invention disclosed is for a new chemically curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The chemically curable liquid polymer composition upon curing in the presence of a chemical free radical generating reagent forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,697,623

N-ARYL-SUBSTITUTED DIALKANOLAMINO POLYURETHANES

Erich Eimers, Krefeld, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 735,511, June 10, 1968, abandoned. This application Sept. 25, 1970, Ser. No. 75,715

Claims priority, application Germany, July 4, 1967, F 52853

Int. Cl. C08g *41/04*

U.S. Cl. 260—859 R **5 Claims**

Molding compositions may be prepared from a solution of an unsaturated polyester prepared from an ethylenically unsaturated dicarboxylic acid and diol, in a copolymerizable monomer exemplified by styrene, vinyl toluene and alkyl acrylates. The solution also contains 0.1 to 5.0 percent weight of an N-aryl-substituted diaklanolamino polyurethane prepared from the reaction product of an N-aryl substituted dialkanolamine, a diisocyanate, and one of a monoisocyanate, a monothioalcohol, or monoamine.

3,697,624

DIISOCYANATE COUPLING OF OXYMETHYLENE POLYMER AND POLYBUTYLENE TEREPHTHALATE

David M. Braunstein, Edison, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 14, 1970, Ser. No. 80,816

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 **16 Claims**

Disclosed herein is a modified oxymethylene polymer having an improved balance of physical properties such as tensile strength, tensile modulus, flexural strength and impact strength. The modified oxymethylene polymer is prepared by the coupling reaction of an oxymethylene polymer and polybutylene terephthalate with an isocyanate or isothiocyanate.

3,697,625

FLAME-RETARDANT POLYESTERS AND THERMOSETTING COMPOSITIONS BASED THEREON

Percy L. Smith, Dunbar, and Lowell R. Comstock, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 715,977, March 26, 1968, abandoned. This application Nov. 23, 1970, Ser. No. 92,238

Int. Cl. C08f *21/00, 21/02*

U.S. Cl. 260—869 **19 Claims**

This invention relates to brominated polyesters, based on diols and as co-reactants a brominated maleic acid, a brominated tetrahydrophthalic acid, anhydrides or brominated monomeric esters of the anhydrides thereof, which are substantially free of dibromosuccinate and dibromohexahydrophthalate groups, contain bromine end groups and possess excellent flame-retardant properties, excellent thermal stability, excellent resistivity to ultraviolet light and can be used as flame-retardant plasticizers and when containing unsaturated groups, derived from non-halogenated unsaturated polycarboxylic acids, can be used in molding applications to form aesthetically attractive thermoset articles characterized by excellent chemical, physical and electrical properties.

3,697,626

N-PHOSPHORYLAMINOETHYL PHOSPHATE

Perttu V. Laakso, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Aug. 15, 1969, Ser. No. 850,636
Int. Cl. C07f 9/08, 9/22
U.S. Cl. 260—926 1 Claim

N-phosphorylaminoethyl phosphate is made from phosphoric acid and 2-aminoethanol. It is useful as a therapeutic agent for producing high absorption and retention of phosphate and calcium with extremely low renal calcinosis.

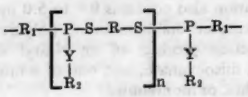
3,697,627

POLYMERCAPTO POLYPHOSPHONITES

Kenneth Rattenbury, and Millard S. Larrison, both of Morgantown, W. Va., assignors to Weston Chemical Corporation, New York, N.Y., by said Rattenbury

Filed July 22, 1969, Ser. No. 879,143
Int. Cl. C07f 9/08, 9/16, 9/32
U.S. Cl. 260—928 9 Claims

Compounds are prepared of the formula



where n is an integer of 1 to 10, Y is oxygen or sulfur, R_1 and R_2 are alkyl, haloalkyl, aryl, haloaryl, alkenyl, aralkyl, haloalkenyl or cycloalkyl and R is a divalent aromatic, aliphatic or cycloaliphatic group.

The compounds are useful as stabilizers.

3,697,628

BENZYLATION OF TRIARYL PHOSPHATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,780
Int. Cl. C07f 9/08, 9/12
U.S. Cl. 260—968 6 Claims

Benzylation of triaryl phosphates is accomplished by reacting a triaryl phosphate with a benzyl halide in the presence of a Lewis acid.

3,697,629

METHOD AND PRODUCT OF MAKING MULTIFOCAL CONTACT LENSES AND LENS BLANKS

Leonard Bronstein, 7457 East Vista Drive, Scottsdale, Ariz.

Filed Feb. 26, 1970, Ser. No. 14,269
Int. Cl. B29d 11/00
U.S. Cl. 264—1 4 Claims

This specification discloses a method of making a contact lens blank including the steps of grinding a circular substrate to form a curved surface on a face thereof, forming a plastic mold with a curved surface complemental to that of the substrate and a pair of through passages opening onto its curved surface and of a desired cross-section, inserting a segment of a plastic material having one index of refraction different to that of said substrate and having a cross-section corresponding to that of said passage in each of said passages, clamping said mold to said substrate, bonding said segments to the curved surface of the substrate by heat and fusion, removing said mold from the substrate and segments, and restoring its original shape to the substrate by applying thereto a plastic having an index of refraction different from that of the substrate and segments. Methods having alternative steps are also disclosed.

3,697,630

BONDING OR REPAIRING PROCESS

Stanley Y. Yoshino, Monterey Park, Calif., assignor to Granted to National Aeronautics & Space Administration under the provisions of 42 U.S.C. 2457(d)

Filed Aug. 23, 1967, Ser. No. 662,763
Int. Cl. B05b 3/00
U.S. Cl. 264—28 7 Claims

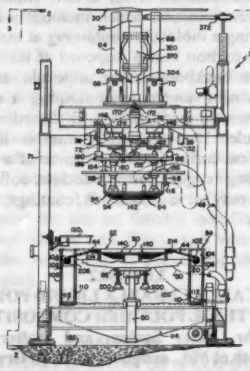
A process for bonding a resinous body in a cavity is described including the steps of outgassing and freezing a body of normally liquid, uncured resinous material to form a void free body and fitting the frozen body into a cavity. Thereafter the frozen resinous material is thawed and the liquid conforms to the shape of the cavity. The resinous material is then cured in the cavity to provide a good bond to the walls thereof.

3,697,631

METHOD AND APPARATUS FOR FORMING A MEMBER FROM AN EXCESS SLURRY OF REFRACTORY MATERIAL

Walter M. Charman, Jr., Shaker Heights; Robert R. Hayes, Euclid; George J. Middaugh, Jr., Chesterland, and John M. Wetzig, III, Chagrin Falls, all of Ohio, assignors to Oglebay Norton Company, Cleveland, Ohio

Filed Nov. 10, 1969, Ser. No. 875,276
Int. Cl. B22c 15/22; D21j 3/00
U.S. Cl. 264—37 31 Claims



An improved machine or apparatus for forming member from a slurry of refractory material includes a pair of mold sections which cooperate to form a cavity. A flexible diaphragm extends around the mold sections and is movable to an inwardly and downwardly sloping position to form a trough connected in fluid communication with the mold cavity. The mold cavity is flooded by filling the trough with the slurry of refractory material. Water is then drawn from the slurry in the mold cavity to form a wet-cake of refractory material. The water content of this wet-cake of refractory material is at least partially controlled with an adjustable timer which regulates the length of time for which water is drawn from the mold cavity. After sufficient refractory material has been deposited in the mold cavity to form a wet-cake having the shape of the member to be formed, the diaphragm is moved to an outwardly and downwardly sloping position to

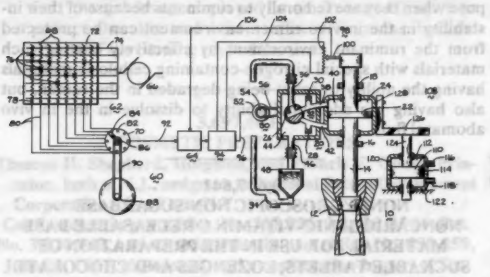
enable excess slurry to flow away from the mold sections and into a receptacle. The excess slurry is pumped from this receptacle to a main mixing or batch tank where it is mixed with a relatively large quantity of the slurry. Therefore, when this excess slurry is subsequently reused, it will have a water content or consistency corresponding to that of the main batch of slurry.

3,697,632

BLOW MOLDING

Arnold J. Tenner, West Haven, Conn., assignor to Monsanto Company, Saint Louis, Mo.

Filed June 26, 1969, Ser. No. 851,521
Int. Cl. B29c *17/07*; B29f *3/01*
U.S. Cl. 264—40 6 Claims



This invention relates to method and means for controlling the material distribution of a plastic parison during extrusion by a control system used to vary the opening of the extrusion outlet.

3,697,633

STRUCTURAL CORE

Howard M. Edgar, 14802 Newport Avenue Apt 3B, Tustin, Calif.

Continuation-in-part of Ser. No. 600,897, Dec. 12, 1966, abandoned. This application July 21, 1970, Ser. No. 56,832
Int. Cl. B29d *27/04*; B29h *7/20*; B32b *31/18*
U.S. Cl. 264—45 12 Claims

A structural core is formed by filling a rigid frame with an expanded synthetic polymer composition which may include fillers and which is adhesively secured to the frame. The resultant foam filled frame is then sliced to form panel cores. Finished panels are made by laminating panel faces to one or both sides of the core, or by painting, or otherwise treating the panel core. In one embodiment, the frame may be built up of a plurality of frame members with removable spacers to permit sawing of the foamed material without sawing the frame. The cores and panels thus constructed are useful in doors, walls, floors, roofs, etc. in buildings and in furniture and other structures outside the building industry. Reinforcing, electrical conductors, plumbing, etc. may also be built into the cores.

3,697,634

ALIGNMENT AND ORIENTATION OF WHISKERS AND FIBERS

Karl P. Staudhammer, and Vernon H. Reineking, both of Gardena, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 24, 1969, Ser. No. 887,914
Int. Cl. B29j *1/00*
U.S. Cl. 264—109 3 Claims

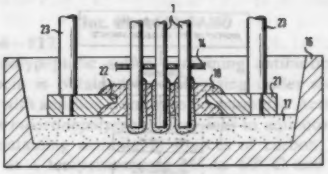
Alignment of fibers or whiskers such as β-SiC and α-A_2O_3 is accomplished by suspending unoriented whiskers into an ethylene glycol solution and adding several drops of amyl acetate to the solution near the center to produce a rolling action at the interface due to the motion of the solutions as they mix with each other. The unoriented whiskers are caught up in the rolling interface and are aligned into a thread.

3,697,635

PROCESS FOR THE MANUFACTURE OF CAPILLARY EXCHANGERS

Hans Joachim Dietzsch, Villars-sur-Ollon, and Otto Dietzsch, Stein am Rhein, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 831,174, June 6, 1969. This application April 16, 1971, Ser. No. 134,804
Claims priority, application Switzerland, June 8, 1968, 8632/68; Australia, May 27, 1969, A 5012/69
Int. Cl. B32b *3/26*, *31/12*
U.S. Cl. 264—135 9 Claims



A process for the manufacture of capillary exchangers in which the capillaries are arranged side by side in spaced relationship to each other, is described and comprises the steps of

a. coating the end zones of a number of capillaries produced in the above-described manner and still containing their auxiliary cores, with reinforcing mantles of a material capable of superficially dissolving the wall of the capillary during its application;
b. arranging these capillaries in a bundle leaving spaces between them for the flow of a liquid or gaseous medium therethrough;
c. pouring between the reinforcing mantles at one end of the bundle a layer of a hardenable material capable of adhering sealingly to the said mantles, whereby the ends of the capillaries at the level of their adjacent reinforcing mantles are embedded in a transverse wall formed by said material after hardening, and
d. removing the auxiliary cores from the capillaries before or after step (c).

3,697,636

PROCESS AND APPARATUS FOR MANUFACTURING FIBERS OR YARNS FROM MOLECULARLY ORIENTABLE ORGANIC POLYMERIC FILMS

Wladyslaw H. Skoroszewski, Manchester, and Dennis S. Stones, Bolton, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,232
Claims priority, application Great Britain, June 26, 1969, 32,364/69
Int. Cl. B29d *7/20*
U.S. Cl. 264—147 9 Claims

An improved process for the production of fibers or yarns of molecularly orientable organic polymer in which a polymer web is grooved by a rigid profiling element, the resulting profiled web being subsequently stretched and split into individual fibers, characterized that the profiling element forms an edge bead in the web of width sufficient to prevent a groove formed in the profiled web from running into an edge as a result of any lateral movement of said web.

3,697,637

METHOD FOR PRODUCING HIGHLY CRIMPED REGENERATED CELLULOSE FIBERS BY STEAM STRETCHING

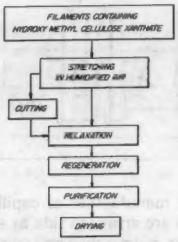
Atsushi Kawai; Takehiro Katsuyama; Migaku Suzuki, and Hisao Takimoto, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 12, 1970, Ser. No. 45,669

Claims priority, application Japan, June 24, 1969, 44/49832; June 24, 1969, 44/49833

Int. Cl. D01f *3/28*

U.S. Cl. 264—168 12 Claims



Highly crimped regenerated fibers can be obtained by stretching filaments containing the reaction product of cellulose xanthate and formaldehyde in a humidified atmosphere having a relative humidity of more than 50 % and kept at a temperature of 40° to 130° C., relaxing said filaments while in a state of regeneration degree of less than 89 % in a liquid having a swelling action on said filaments and maintained at a temperature of 30° to 90° C. and then subjecting the filaments to regeneration treatment to complete regeneration.

3,697,638

ANTIGENS

Hans John Hansen, Allendale, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, which is a continuation-in-part of Ser. No. 42,526, June 1, 1970. This application April 12, 1971, Ser. No. 133,404

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 20 Claims

Antigens associated with carcinomas and adenocarcinomas as well as methods for isolating, identifying and detecting them are disclosed.

3,697,639

SEROLOGICAL TEST FOR THE DETECTION OF HEPATITIS

James F. McCuller, East Northport, L.I., N.Y., assignor to Leslie I. Lukash, Rockville Center; George Shearer, Levittown and Joseph L. Scalise, Seaford, N.Y., part interest to each

Filed Dec. 8, 1969, Ser. No. 883,261

Int. Cl. A23j *1/06*; C07g *7/00*; G01n *33/16*

U.S. Cl. 424—12 10 Claims

A diagnostic test procedure for infectious and serum hepatitis involves the cryogenic fractionation of human blood serum followed by careful separation of the bottom fraction of cryoprecipitate. A selected glycine-saline processing reagent having a particular concentration and pH is added to the fraction after separation thereof and the resultant mixture is incubated to provide a processed serum for both preliminary and confirmatory testing. In the preliminary test procedure equal portions of the processed serum and a special immunological diagnostic reagent are mixed on a glass slide. A positive reaction occurs within 1 minute as evidenced by the presence of a visible colloidal aggregate. The confirmatory test procedure utilizes a similar though more refined and discriminatory technique employing more precisely measured amounts of the processed serum and diagnostic reagent followed by intermixing and macroscopic reading of the sedimentation rate within the mixture. The immunological diagnostic reagent is a latex suspension in a saline buffer solution. The suspension contains polystyrene particles coated with a globulin fraction.

3,697,640

RUMEN STABLE MEDICAMENT AND/OR NUTRIENT COMPOSITIONS

Peter M. Grant, Kingsport, Tenn.; Brazelton Fulkerson, and John W. Mench, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 758,874, Sept. 10, 1968. This application Oct. 27, 1970, Ser. No. 84,295

Int. Cl. A61k *9/00*

U.S. Cl. 424—35 24 Claims

Materials such as medicaments and nutrients that decompose when they are fed orally to ruminants because of their instability in the in vivo rumen environment can be protected from the ruminant environment by effectively coating such materials with special nitrogen-containing cellulosic materials having the ability to resist being degraded in the rumen, but also having the additional ability to dissolve in the in vivo abomasal fluid.

3,697,641

NONHYGROSCOPIC NON-SUGARBASE NONCARIOGENIC-VITAMIN C RELEASABLE BASE MATERIAL FOR USE IN THE PREPARATION OF SUCKABLE TABLETS, LOZENGES AND CHOCOLATE

Gerhard W. Ahrens, 1781 East 15th Street, Brooklyn, N.Y.

Filed Jan. 2, 1970, Ser. No. 468

Int. Cl. A61j *3/06*; A61k *15/12*

U.S. Cl. 424—38 10 Claims

This invention relates to novel nonhygroscopic non-sugarbase and noncariogenic Vitamin C releasable base materials of suitable structural soundness for use in the preparation of and incorporation in suckable tablets, lozenges and chocolate, alone or in conjunction with suitable other desired additions such as flavoring-, medical-, antimicrobial-, sweetening-, coloring agents and the like, and including agents generally employed in the art of tablet, lozenge, and chocolate making, and vitamins, and specifically relates to compositions of the novel base material that may be formed by compounding suitably selected solid glycerides of the self-emulsifying type with calcium ascorbate dihydrate as a noncariogenic-Vitamin C or l-ascorbic acid releasable constituent therein, alone or in admixture with dibasic magnesium phosphate capable of conferring upon products prepared with said base material, including tablets, lozenges, and chocolate, anti-cariogenic properties as well.

The invention relates also to the use of those selected solid glycerides of the self-emulsifying type as being useful for compounding with calcium ascorbate dihydrate, alone or in conjunction with dibasic magnesium phosphate and other desired ingredients, which are derived from at least one of the group including edible fats; oils; and edible fat-forming fatty acids and the preferred forms of the glycerides selected for forming the base material of the invention as a constituent therein are glycerol stearate; glycerol palmitate and mixtures of glycerol stearates with glycerol palmitates which contain in their respective compositions each at least about thirty parts by weight percent mono-ester groups.

3,697,642

METHOD OF PROTECTING THE SKIN FROM ULTRAVIOLET RADIATION WITH TITANIC ACID AND ESTERS OF TITANIC ACID

Edward J. Madigan, Denver, Colo., assignor to Cosmetics & Pharmaceuticals, Inc., Denver, Colo.

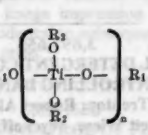
Filed March 3, 1969, Ser. No. 803,951

Int. Cl. A61l *23/00*

U.S. Cl. 424—59 3 Claims

An effective ultra-violet absorber composition and process for controlling sunburn by applying to the skin a composition

which comprises a hydrated, substantially transparent gel represented by the formula:



wherein:

a. R_1 and R_2 are independently selected from the group consisting of hydrogen, short chain alkyl, and ligands capable of chelate formation, and

b. *n* is any integer in a dermatologically acceptable carrier, the gel being employed in an amount effective to protect the skin and other surfaces from the harmful effects of the burning rays of the sun.

3,697,643

COSMETIC PREPARATIONS

Thomas H. Shepherd, Hoepwell, and Francis E. Gould, Princeton, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 567,856, July 26, 1966, Pat. No. 3,520,949, and a continuation-in-part of Ser. No. 650,259, June 30, 1967, abandoned, and a continuation-in-part of Ser. No. 654,044, July 5, 1967, and a continuation-in-part of Ser. No. 743,626, July 10, 1968, Pat. No. 3,574,822. This application Jan. 15, 1970, Ser. No. 98,464

Int. Cl. A61k 7/02

U.S. Cl. 424—63 **5 Claims**

Mascara is prepared by adding a hydrophilic acrylate or methacrylate polymer to the selected cosmetic preparations.

3,697,644

COSMETIC COMPOSITION

Donald David Laiderman, Deerfield, Ill., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 18, 1966, Ser. No. 587,387

Int. Cl. A61k 7/06

U.S. Cl. 424—70 **5 Claims**

An aqueous cosmetic composition adapted to be coated on the skin or hair and to deposit a thin film of water-insoluble cosmetic material comprising an aqueous medium having a protective colloid, and dispersed therein a solution of said water-insoluble cosmetic material in an organic solvent, which solvent is selected from the class of volatile water-insoluble solvents and solvents soluble in water at room temperature only to a limited extent.

3,697,645

PURIFICATION OF ANTIBODIES

Eugene P. Meier, Edgewood; David E. Lenz, Bel Air, and Ludwig A. Sternberger, Lutherville, all of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed April 28, 1971, Ser. No. 138,354

Int. Cl. A61k 27/00

U.S. Cl. 424—85 **11 Claims**

Recovering the entire spectrum of all heterogeneous antibodies against a specific antigen or ligand by a process of adding an antigen to an immune serum forming a precipitate which is dissociated by a combination of addition of excess hapten and a non-specific dissociating compound and separating the dissociated heterogeneous antibodies from the antigen, hapten and dissociating compounds added.

3,697,646

ANTIBIOTIC SUBSTANCE FROM A THERMOPHILIC ACTINOMYCETES

Carolina Coronelli, and Renato Craveri, both of Milan, Italy, assignor to Lepetit S.p.A.—Gruppo per la Ricerca Scientifica e la Produzione Chimica Farmaceutica, Milan, Italy

Continuation-in-part of Ser. No. 454,718, May 10, 1965, abandoned, and a continuation of Ser. No. 736,662, June 13, 1968, abandoned. This application April 2, 1969, Ser. No. 815,253

Claims priority, application Great Britain, May 22, 1964, 21,259/64

Int. Cl. A61k 21/00

U.S. Cl. 424—117 **3 Claims**

A new polypeptidic sulfur containing antibiotic, named thermothiocin is obtained by cultivating under submerged conditions with aeration a strain to thermophilic Actinomyces named *Thermoactinopolyspora coremialis* in aqueous nutrient medium containing assimilable sources of carbon, nitrogen and sulfur at a temperature of 35° to 60° C and at a pH between 5 and 10.5 The antibiotic is active both in vitro and in vivo against Gram-positive bacteria.

3,697,647

FEED CONTAINING ENDURACIDIN

Toshiro Matsuoka, Suita; Keinosuke Takeda; Minoru Goto, both of Kyoto, and Akira Miayake, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

Filed Jan. 25, 1968, Ser. No. 700,385

Claims priority, application Japan, Jan. 25, 1967, 42/4408

Int. Cl. A61k 21/00

U.S. Cl. 424—18 **9 Claims**

Enduracidin is a valuable additive for feedstuff and/or drinking water for livestock. It excels, for instance, aureomycin as such additive in its action as growth enhancing agent.

3,697,648

ANTIBIOTIC SF-767-A AND SF767-L SUBSTANCES, AND PROCESS FOR PRODUCING SAME CULTURING A CERTAIN STREPTOMYCES MICROSPOREUS

Takashi Shomura; Norio Ezaki, both of Yokohama-shi; Takashi Tsuruoka; Tomizo Niwa, both of Kawasaki-shi; Eiichi Akita, Tokyo, and Taro Nilda, Yokohama-shi, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 15, 1969, Ser. No. 824,885

Claims priority, application Japan, May 24, 1968, 43/34716; June 28, 1968, 43/44682

Int. Cl. A61k 21/00

U.S. Cl. 424—118 **7 Claims**

This invention relates to new antibiotic substances having a broad antibacterial spectrum and called SF–767–A substance and SF–767–L substance, respectively and a method of producing them by culturing a micro-organism *Streptomyces microsporeus* identified as ATCC No. 21384.

3,697,649

PROCESS FOR THE PRODUCTION OF ANTIBIOTIC W847-A FROM RELATED ANTIBIOTICS

Hans Reimann, Wayne, N.J., assignor to Schering Corporation, Bloomfield, N.J.

Filed May 6, 1968, Ser. No. 726,738

Int. Cl. A61k 21/00

U.S. Cl. 424—120 **8 Claims**

Antibiotic W847 Complex or components thereof are converted into one discrete substance, Antibiotic W847–A, by controlled alkaline hydrolysis.

3,697,650

ANTIBIOTIC SL 3364

Annemarie Closse, Binningen, and Eugen Harri, Therwil, both of Switzerland, assignors to Sandoz Ltd. (a/k/a Sandoz AG), Basel, Switzerland

Filed March 11, 1970, Ser. No. 18,533

Claims priority, application Switzerland, March 18, 1969, 4020/69; March 31, 1969, 4827/69

Int. Cl. A61k *21/00*

U.S. Cl. 424—122 3 Claims

The invention concerns the new antibiotic SL 3364 having the following characteristics: crystals having the composition of C = 69.6 %, H = 5.7 % and O = 24.2 %, a melting point of 169°–171 C, a specific rotation of $[\alpha]_d^{20} = -388°$ (c = 0.06 in chloroform) and showing characteristic ultraviolet and infrared spectrums.

The antibiotic possesses a fungistatic effect and furthermore exhibits a cytostatic effect on mostocytoma p 815 in vitro.

3,697,651

SALMONELLACIDE COMPOSITION-CONTAINING PROPIONIC ACETIC AND BUTYRIC OR PHOSPHORIC ACIDS

Mahmood H. Khan, Chicago, and Myron M. Katamay, Oak Forest, both of Ill., assignors to Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.

Filed April 18, 1969, Ser. No. 817,558

Int. Cl. A01n *11/00, 13/00*

U.S. Cl. 424—128 2 Claims

Salmonellacides for use in animal by-product meal materials comprise propionic acid alone and in combination with such complementary acid materials as acetic, butyric, citric, lactic and phosphoric acids.

3,697,652

N-ACETYLGLUCOSAMINE FOR TREATING DEGENERATIVE AFFLICTIONS OF THE JOINTS

Luigi Rovati; Sergio Mascherpa, and Pierluigi Casula, all of Valosa, Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy

Filed Aug. 19, 1969, Ser. No. 851,446

Claims priority, application Germany, Aug. 22, 1968, P 17 92 346.5

Int. Cl. A61k *27/00*

U.S. Cl. 424—180 7 Claims

Pharmaceutical preparations for the treatment of degenerative afflications of the joints, with such preparations containing as the active ingredient one or more N-acyl compounds of aminocarbohydrates.

3,697,653

A METHOD OF TREATING OSTEOARTHRITIC JOINTS WITH POLYSILOXANES

Milne Joseph Ongley, 13 Willis Street, Wellington, New Zealand

Filed July 11, 1969, Ser. No. 841,151

Int. Cl. A61k *27/00*

U.S. Cl. 424—184 4 Claims

Joints are treated for osteoarthritis and other conditions in both animals and human beings by injection of pure polysiloxane fluid (such as dimethylpolysiloxane, methylphenylpolysiloxane and fluoromethylpolysiloxane).

3,697,654

METHOD OF TREATING HYPERCHLORHYDRIA AND/OR ASSOCIATED CONDITIONS

Wilbur Lippmann, Montreal, Quebec, Canada, assignor to Ayerst, McKenna and Harrison, Limited, St. Laurent, Quebec, Canada

Division of Ser. No. 866,396, Oct. 14, 1969, which is a continuation-in-part of Ser. No. 826,657, May 21, 1969, abandoned. This application Nov. 22, 1971, Ser. No. 201,175

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 3 Claims

A method for preventing the secretion of excessive amounts of hydrochloric acid in the stomach of humans suffering from hyperchlorhydria and/or associated conditions, by administering an effective amount of N,3,3-trimethyl-1-phenyl-1-indanpropylamine.

3,697,655

GERMICIDAL DETERGENT COMPOSITIONS IN CONTROLLING DANDRUFF

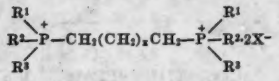
Herman Berenson, Trenton; Robert Alden Stonier, Glen Rock, and Eugene Everett Wiese, Wyckoff, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 783,123, Dec. 11, 1968, abandoned. This application Oct. 28, 1969, Ser. No. 871,960

Int. Cl. A61k *27/00*

U.S. Cl. 424—204 6 Claims

Compositions, generally useful for germicidal detergent applications, comprising a mixture of (a) an amphoteric surfactant such as N-coco β-amino propionic acid or a fatty (coco) amido alkyl betaine and (b) an organophosphorus salt of the formula:



wherein R^1, R^2 and R^3 independently are alkyl (C_1—C_{12}), phenyl, or hydroxyalkyl (C_1—C_4); x is 6–14 and X is an anion. Compound (b) is also useful, in aqueous or alcoholic solution, or with other cosmetically acceptable ingredients, in the control of dandruff.

3,697,656

INSECTICIDAL METHOD USING 3-METHYLENEDIOXY-PHENYL SUBSTITUTED RHODANINES

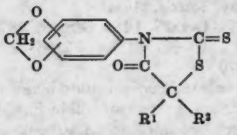
Joseph Patrick Brown, Llangollen, Wales, assignor to Monsanto Chemicals Limited, London, England

Division of Ser. No. 586,053, Oct. 12, 1966, abandoned. This application Oct. 22, 1969, Ser. No. 870,731

Int. Cl. A01n *9/12*

U.S. Cl. 424—270 3 Claims

An insecticidal method comprising contacting insects with an insecticidally effective amount of a compound having the formula



where R′ is alkyl of not more than eight carbon atoms and R^2 is selected from the group consisting of hydrogen and alkyl of not more than eight carbon atoms.

3,697,657

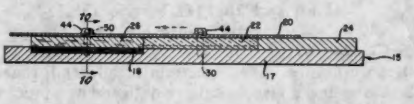
METHOD FOR MAKING MULTIPLE IMAGE ELECTROTYPE MOLDS

Laurence J. Kisker, Lancaster, and William G. Mathewson, Tonawanda, both of N.Y., assignors to J. W. Clement Company, Depew, N.Y.

Division of Ser. No. 718,712, April 4, 1968, Pat. No. 3,593,376. This application May 27, 1970, Ser. No. 48,701

Int. Cl. B29c *3/00*

U.S. Cl. 264—293 1 Claim



A method and apparatus for preparing multi-image matrices for printing plates from photo-engravings or the like in the black-white and multi-color printing industries; featuring use of a thermoplastic mold sheet impressed successively at adjacent areas thereof against a single engraving, to produce a multi-image mold. The apparatus includes mold register guide

forming means functioning automatically to precisely register the mold sheet as it is shifted from one impression operation to another. Also, the apparatus features means for insulating each previously made image impression against resoftening and/or deformation incidental to subsequent processing of the mold sheet in the mold press.

3,697,658

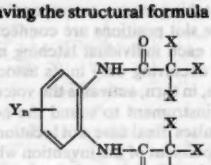
PROCESS FOR THE CONTROL OF PESTS WITH N,N'-BIS(HALOACETYL)-4,5-SUBSTITUTED-O-PHENYLENE DIAMINES, assignor to Edmund J. Rumanowski, Dover, N.J. and Tenneco Chemicals, Inc.

Division of Ser. No. 677,853, Oct. 25, 1967, Pat. No. 3,557,211. This application Sept. 23, 1970, Ser. No. 74,936

Int. Cl. A01n 9/20, 9/24

U.S. Cl. 424—324 **7 Claims**

Compounds having the structural formula



wherein each X represents hydrogen, chlorine, or fluorine; each Y represents halogen, lower alkyl, lower alkoxy, cyano, trifluoromethyl, or nitro; and *n* represents an integer in the range of zero to four are useful in the control of the growth of fungi, insects, and mites. Illustrative of these compounds are N,N'-bis(trichloroacetyl)-4,5-dichloro-o-phenylene diamine, N,N'-bis(chloroacetyl)-4,5-dichloro-o-phenylene diamine, and N,N'-bis(trifluoroacetyl)-3,4,5-tribromo-o-phenylene diamine.

3,697,659

AMINE CONTAINING ANIMAL FEED COMPOSITIONS

Gino J. Marco, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. Nos. 504,997, Oct. 24, 1965, abandoned, and Ser. No. 583,080, Sept. 29, 1966, abandoned. This application Oct. 28, 1968, Ser. No. 771,331

Int. Cl. A61k 27/00; A23k 1/16

U.S. Cl. 424—325 **15 Claims**

Animal feed compositions comprising certain amino compounds are useful for stimulating the growth of animals and improving feed efficiency.

ELECTRICAL

3,697,660

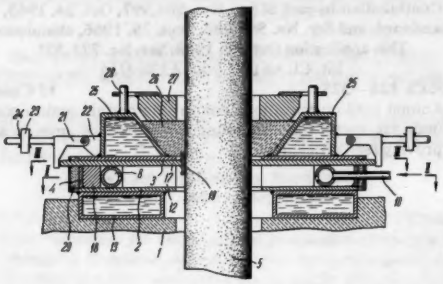
DEVICE FOR SEALING GAP BETWEEN ELECTRODE AND LINING OF ELECTRIC ARC FURNACE

Jury Fedorovich Frolov, prospekt K. Marxa, 8/2, kv. 70; Ivan Petrovich Nechaev, ulitsa Sibiryakov-Guardeitsev, 22, kv. 35; Anany Maximovich Basalaev, ulitsa Rimskogo-Korsakova, 7/1, kv. 5; Jury Dmitrievich Bedarev, ulitsa Pamirskaya, 100/1, kv. 4, and Viktor Valerjanovich Golikov, ulitsa Novogodnyaya, 20, kv. 54, all of Novosibirsk, U.S.S.R.

Filed March 16, 1970, Ser. No. 19,839

Int. Cl. H05b 7/12

U.S. Cl. 13—17 **13 Claims**



A sealing device for the gap between an electrode and a lining of an electric furnace comprises a chamber through which the electrode passes. This chamber is supplied with an inert gas under pressure from the holes of at least two curved headers which form a ring around the electrode. Installed between the headers and the part of the chamber through which the electrode passes are vanes which form identical acute angles with a respective radius drawn from the center of the chamber to the base of each vane, for creating a circular flow of the inert gas around the electrode. As a result, a gas flow is created near the electrode, preventing escape of gases from the furnace into the atmosphere.

3,697,661

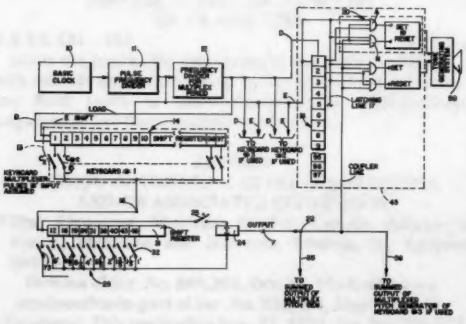
MULTIPLEXED PITCH GENERATOR SYSTEM FOR USE IN A KEYBOARD MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to North American Rockwell Corporation

Filed Oct. 4, 1971, Ser. No. 186,360

Int. Cl. G10h 1/00

U.S. Cl. 84—1.01 **21 Claims**



The present invention is a multiplexed pitch generator system for use in a keyboard musical instrument to activate the voice controls of the instrument in accordance with key depressions. In the preferred embodiment of the invention there is provided a means for stepping pulses into a plurality of time slots in a cyclic manner. A plurality of keys are provided with each time slot corresponding to one particular key, and each key corresponding to a particular note. Pitch means are provided for receiving the time division multiplex signal with the gated pulses and for shifting the time slot position of selected pulses to a desired time slot location so as to simulate another note. Comparing means are used to compare the time slot position of the pulses from the pitch means with the time division multiplex signal to determine the final time slot position of a pulse. Latching means corresponding in number to the number of time slot positions are connected to the comparing means with each individual latching means being activated by a pulse occurring only in its associated time slot. The latching means, in turn, activates the voice controls of the keyboard musical instrument to sound the note or pitch associated with the pulses' final time slot location.

In a second embodiment of the invention which is used on a multiple keyboard instrument, each keyboard has one multiplexed pitch generator system associated therewith and, in addition, the output signal from the pitch generating means of one or more keyboards are connectable to the outputs from the other multiplexed pitch generators such that the musician can play a key on one keyboard and have it sound as if played from another keyboard.

3,697,662

KEYING SYSTEM CAPABLE OF PRODUCING PIANO-TONE EFFECTS FOR USE IN ELECTRONIC MUSICAL INSTRUMENTS

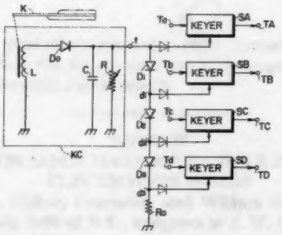
Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Dec. 16, 1970, Ser. No. 98,653

Claims priority, application Japan, Dec. 18, 1969, 44/120259; Dec. 18, 1969, 44/120260; Dec. 18, 1969, 44/101840; Dec. 18, 1969, 44/101841; Dec. 18, 1969, 44/101842

Int. Cl. G10h 1/06

U.S. Cl. 84—1.13 **12 Claims**



In a keyboard electronic musical instrument, a keying system is described which includes, per key and associated therewith, a percussive pulse generating circuit for generating a percussive pulse having a peak amplitude responsive to the key depressing speed, a divider circuit consisting of serially connected diodes or resistors which are supplied with the percussive pulse and in response thereto deliver percussive pulses of successively different amplitudes from a highest to a lowest. A plurality of tone keyers are also provided for respectively keying tone signals of different frequencies, which keyers are respectively controlled by the different amplitude percussive pulses delivered from the divider circuit, wherein the higher amplitude pulse controls the lower frequency keyer, etc. Thus, when a key is struck, a composite percussive sound is

produced which includes a plurality of different frequency tones, wherein the higher frequency signals decays faster than the lower frequency signals. Thus the sounding effects of a piano are better simulated.

3,697,663

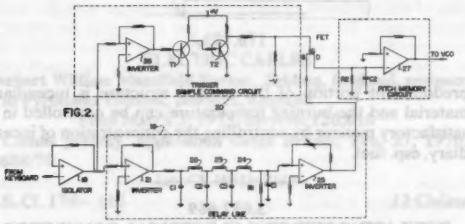
PITCH SUSTAINING MEANS FOR A KEY-OPERATED MONOPHONIC INSTRUMENT

Rene Farley, and David O. Rocheleau, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Sept. 23, 1971, Ser. No. 183,097

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.13 **3 Claims**



A pitch sustaining circuit having a sample command circuit and a delay line in parallel which have their inputs connected to the keyboard contact input, a field effect transistor having its source connected to the delay line output, its gate connected to the output of the sample command circuit, and a pitch memory circuit having its input connected to the drain of the field effect transistor and its output connected to a voltage controlled oscillator.

3,697,664

ELECTRONIC MUSICAL INSTRUMENT HAVING AUTOMATIC BASS TONE SELECTOR

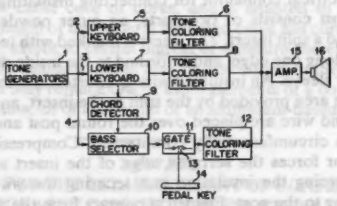
Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed March 3, 1971, Ser. No. 120,651

Claims priority, application Japan, Dec. 10, 1969, 44/116848; Dec. 10, 1969, 44/116849

Int. Cl. G10h *3/06*

U.S. Cl. 84—1.17 **3 Claims**



In an electronic musical instrument comprising an upper keyboard for a melody performance, a lower keyboard for a chord performance and a pedal keyboard for a bass performance there are provided a chord detector for detecting the type of a chord played on the lower keyboard upon depression of the keys thereof; a bass selector responsive to outputs from the chord detector for selectively coupling out from the tone generators bass tone signals corresponding to a note included in the chords played on the lower keyboard; and a gate circuit supplied with the bass tone signals from the bass selector and so designed as to be enabled by operation of one of the keys of the pedal keyboard. The pedal keyboard comprises only one or two keys for controlling one gate circuit supplied with one bass tone signal corresponding to the root note, or two gate circuits supplied respectively with one bass tone signal corresponding to the root note and fifth note included in the chord played on the lower keyboard.

3,697,665

POWER LINE SYSTEM AND METHOD FOR THE TRANSMISSION OF ELECTRIC ENERGY OVER LOW TEMPERATURE ELECTRIC CONDUCTORS

Conrad Doose, and Wolfgang Sassin, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 15, 1970, Ser. No. 98,231

Claims priority, application Germany, Dec. 15, 1969, P 19 62 745.3

Int. Cl. H01b *7/34*

U.S. Cl. 174—15 C **6 Claims**

In a power line system for transmitting electric energy over electric conductors cooled by a coolant flowing in conduits associated with the conductors which, in turn, are surrounded by a radiation shield cooled by a coolant flowing in conduits associated with the radiation shield; the flow rate of the coolant through any cross-sectional area laid across all the first-named conduits, as well as the flow rate of the coolant through any cross-sectional area laid across all the second-named conduits is unequalized. Further, the power line system includes refrigeration machines to set to the optimal operating temperatures the coolant associated with the conductors and the coolant associated with the radiation shield.

3,697,666

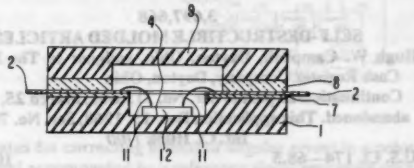
ENCLOSURE FOR INCAPSULATING ELECTRONIC COMPONENTS

Wilbur T. Wakley, and Michael T. Leeds, both of San Diego, Calif., assignors to Diacon, Inc., San Diego, Calif.

Filed Sept. 24, 1971, Ser. No. 183,470

Int. Cl. H05k *5/00*

U.S. Cl. 174—52 S **4 Claims**



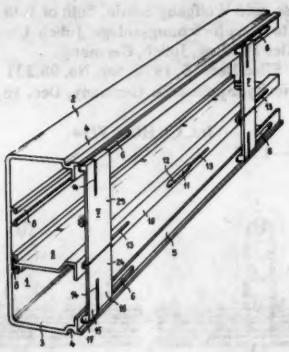
An enclosure for encapsulating an electronic component including a substrate and a conductive lead frame attached to the substrate and embedded in a composite glass layer, the layer having two portions. The lower portion is a substantially devitrified glass and the upper portion is a substantially non-devitrified glass. The lead frame has surfaces exposed for electrical contact both within and without the perimeter of the substrate, the intermediate part of the lead frame between the exposed portions being embedded in the composite glass layer.

3,697,667

INSTALLATION CHANNEL

Gottfried Pollak, Waldfischbach-Burgalben, and Peter Kolb, Pirmasens, both of Germany, assignors to Firm Tehalit Kunststoffwerk G.m.b.H, Heltersberg/Pfalz, Germany

Filed June 29, 1971, Ser. No. 157,976
Int. Cl. H01b 7/00; F16l 55/00
U.S. Cl. 174—68 C 2 Claims



Installation channel to be mounted on building walls which is of rectangular cross-section and has an open side opposite the mounting wall which can be closed by a cover, where spacing bars are provided for subdividing the channel into a plurality of electrically separated chambers. Means defining grooves are opposite the open side of the channel on the mounting wall for supporting the spacing bars, the side walls of the channel as well as the separating bars have free edges with elongated slots for cooperation clamps to be mounted therein. Clamps having ends to be introduced in the slots at the free edges of the channel side walls are provided with an angularly offset portion of rectangular cross-section and an angularly offset area portion of arrow-shaped cross-section on one side with an undercut, which portions are separated from one another by a longitudinal slot, the portion of rectangular cross-section has an inner edge which registers with the undercut portion of the area that is of arrow-shaped cross-section on one side, and the portion of rectangular cross-section is of a width corresponding to the width of the slots in the free edges of the side walls of the channel and projects beyond the portion of arrow-shaped cross-section on one side by an amount corresponding to the depth of the undercut.

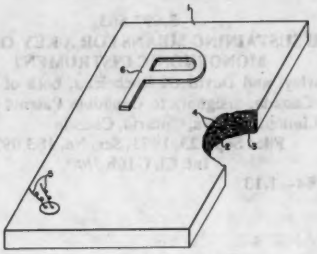
3,697,668

SELF-DESTRUCTIBLE MOLDED ARTICLES

Hugh W. Campbell, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 715,605, March 25, 1968, abandoned. This application Dec. 13, 1968, Ser. No. 786,817
Int. Cl. H05k 1/00
U.S. Cl. 174—68.5 10 Claims

This disclosure is directed to on-command, self-destructible, fibrous-reinforced molded structures, e.g., printed circuit assemblies, comprising a plastic-fibrous matrix containing encapsulated material capable of rapid yet non-explosive combustion, e.g., incendiary or pyrotechnic material. The major surfaces (faces) of said structures can be provided with an electroconductive portion(s), or conductive face, e.g., metallic, materials (facing sheets) can be secured thereto. One of the facing sheets can constitute or contain a printed circuit. All of the incendiary material must be encapsulated to render it inactive at ambient conditions until the desired time for ignition and achieve other advantages. Moreover, the structures can be provided with an igniter(s) to communicate with at least a portion of the encapsulated incendiary composition. A



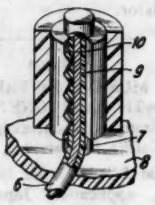
predominant portion of the molded structure is incendiary material and the burning temperature can be controlled in a satisfactory manner by controlling the concentration of incendiary, esp. fuel.

3,697,669

INSULATING PIERCING ELECTRICAL CONNECTOR

Francis A. O'Loughlin, Scotch Plains, and Philip J. Herb, Somerville, both of N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 30, 1970, Ser. No. 76,940
Int. Cl. H02g 15/08
U.S. Cl. 174—84 C 14 Claims



An electrical connector for connecting insulating wire to a round post consists of two parts, an outer powdered metal sleeve and a split insert. The insert is blanked with teeth or serrations along one edge, and is formed to the inside diameter of the outer sleeve. An insulated wire is inserted into the connector in the area provided by the split in the insert, and the connector and wire are placed over the round post and the connector is circumferentially compressed. Compression of the connector forces the serrated edge of the insert against the wire, piercing the insulation and securing the wire and the connector to the post. Electrical contact from the wire to the post is made through the insert.

3,697,670

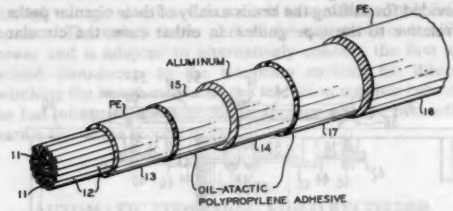
ELECTRICAL CABLE HAVING SHEATH LAYERS BONDED WITH ADHESIVE

Bill Mitacek, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 2, 1971, Ser. No. 204,023
Int. Cl. H01b 7/18
U.S. Cl. 174—107 7 Claims

In an electrical cable having at least one polyolefin sheath layer and an aluminum sheath layer, the polyolefin layer is

bonded to the aluminum layer with an adhesive material of 50 to 90 weight percent amorphous polypropylene and 50 to 10 weight percent mineral lubricating oil.



3,697,671

ELECTRIC CABLES

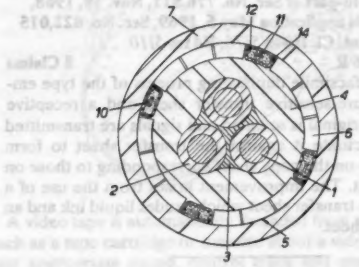
Herbert William Mansfield Parker, Zebbug, England, assignor to Pyrotenax Limited, Durham, England

Filed March 3, 1971, Ser. No. 120,618

Claims priority, application Great Britain, Feb. 27, 1970, 9,688/70

Int. Cl. H01b 7/32

U.S. Cl. 174—115 **12 Claims**



An electric power or communication cable has at least one core comprising an insulated conductor of aluminum or an aluminum-based alloy of high conductivity, a plastics sheath and, incorporated in the cable, a mineral insulated cable of a cross-section that is small in comparison with the overall cross-section of the cable. The mineral insulated cable has a sheath of aluminum or an aluminum-based alloy, is located outside the cable core or cores, and is adapted to indicate when the sheath of the mineral insulated cable has corroded to a sufficient extent to permit ingress of moisture therethrough. The mineral insulated cable may be embedded in the plastics sheath or it may replace one or more elements of a concentric neutral conductor of aluminum or an aluminum-based alloy.

3,697,672

METHOD FOR THE ESTABLISHMENT OF CONFERENCE TELEGRAPHY CONNECTIONS IN CENTRALLY CONTROLLED TELEGRAPHY DIAL EXCHANGE INSTALLATIONS

Hans Reisch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

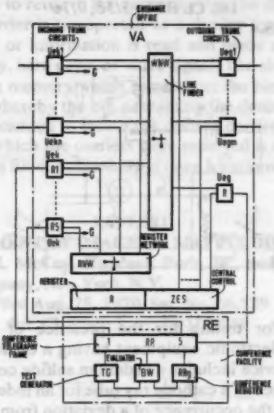
Filed Aug. 18, 1969, Ser. No. 850,979

Claims priority, application Germany, Aug. 21, 1968, P 17 62 761.1

Int. Cl. H04l 11/00

U.S. Cl. 178—3 **4 Claims**

In centrally controlled telegraphy dial exchange installations provided with a facility for making conference connections, the conference telegraphy system is connected to the trunk seized by the calling subscriber over an outgoing trunk, whereupon information necessary to establish the conference connection is registered. Then the conference telegraphy system seizes a number of incoming trunks corresponding to the number of subscribers to take part in the conference call, and the establishment of and accounting for the conference call proceed over the central control means of the exchange, in the manner of individual connections.



3,697,673

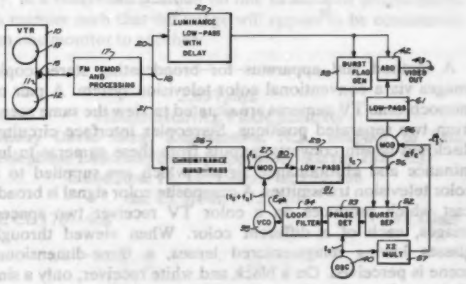
APPARATUS FOR CORRECTING ANGULAR ERRORS IN COLOR VIDEO SIGNALS

Bert H. Dann, Mountain View, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 3, 1969, Ser. No. 873,284

Int. Cl. H04n 5/78

U.S. Cl. 178—5.4 CD **18 Claims**

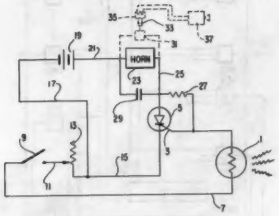


Apparatus for correcting effects of angular errors in a color video signal accompanied by a reference signal processes such color video signal and reference signal to dispose modulation components of the color video signal about a substantially stable carrier while substantially retaining phase and amplitude interrelationships of these modulation components. The processed reference signal is separated from the processed color video signal and an error signal indicative of angular errors in the processed color video signal is derived from the separated processed reference signal. The above mentioned processing is controlled in response to the latter error signal to correct effects of said angular errors.

3,697,674
INTERMITTENT PROBLEM ALARM FOR ELECTRONIC EQUIPMENT BASED ON A CRT IMAGE

Doyle W. Brewington, Omaha, Nebr., assignor to V. F. Ward, Omaha, Nebr.

Filed Sept. 4, 1970, Ser. No. 69,652
Int. Cl. H04n *5/58, 9/16*
U.S. Cl. 178—5.4 TE **23 Claims**

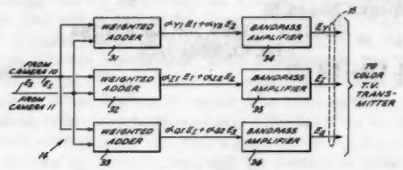


A device for testing for the presence of intermittent problems in electronic equipment having a cathode ray tube image. The device includes a cadmium sulfide cell placed adjacent the screen of a cathode ray tube for an indefinite period of time. Upon the occurrence of a deviation from the set standard an alarm will be actuated.

3,697,675
STEREOSCOPIC TELEVISION SYSTEM

Terry D. Beard, 619 Hampshire Road, Westlake Village, Calif., and Eric R. Garen, 1636 3/4 Franklin Avenue, Santa Monica, Calif.

Filed Dec. 23, 1970, Ser. No. 100,930
Int. Cl. H04n *9/54*
U.S. Cl. 178—6.5 **14 Claims**



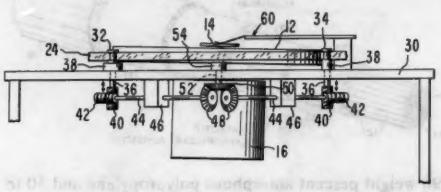
A method and apparatus for broadcasting stereoscopic images via a conventional color television system. A pair of monochrome TV cameras are situated to view the same scene from two separated positions. Stereoplex interface circuitry disclosed herein converts outputs from these cameras to luminance and chrominance signals which are supplied to a color television transmitter. A composite color signal is broadcast which produces on a color TV receiver two spaced images, each of a different color. When viewed through glasses having image-colored lenses, a three-dimensional scene is perceived. On a black and white receiver, only a single image is produced.

3,697,676
HEAD-TO-TAPE ALIGNMENT APPARATUS AND METHOD

Arthur I. Protas, Brooklyn, N.Y., assignor to Cartridge Television, Inc., New York, N.Y.

Continuation of Ser. No. 789,110, Jan. 2, 1969, abandoned. This application June 8, 1971, Ser. No. 151,148
Int. Cl. G11b *15/60, 17/00;* **H04n** *5/78*
U.S. Cl. 178—6.6 P **3 Claims**

Apparatus for bringing a number of oblique signal record tracks on a moving magnetic tape into registry with a number of recording heads of a rotating head tape transport system. In one embodiment, a pair of shiftable tape guides are used to shift the tape relative to and generally axially of the circular paths of the rotating heads. In another embodiment, a means is provided for shifting the heads axially of their circular paths and relative to the tape guides. In either case, the circular



paths of the heads are brought into coincidence with the tape record tracks. To render such circular paths and the record tracks parallel, one of the tape guides can be shifted relative to the other tape guide or the mounting means for the heads can be tilted with respect to the tape.

3,697,677
FACSIMILE COPYING PROCESS

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

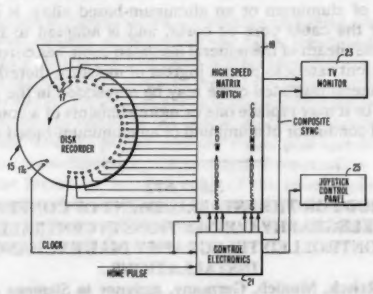
Continuation-in-part of Ser. No. 776,811, Nov. 18, 1968, abandoned. This application May 5, 1969, Ser. No. 822,015
Int. Cl. H04n *5/76;* **B41m** *5/10*
U.S. Cl. 178—6.6 R **8 Claims**

An improved facsimile duplicating process of the type employing a pressure-sensitive transfer sheet and a receptive copy sheet. An original is scanned and signals are transmitted to a stylus to actuate it against the transfer sheet to form duplicate images on the copy sheet corresponding to those on the original sheet. The improvement arises from the use of a squeeze-out type transfer sheet which exudes liquid ink and an absorbent copy sheet.

3,697,678
METHOD AND SYSTEM FOR SELECTIVE DISPLAY OF IMAGES FROM A VIDEO BUFFER

James Garman Belleson, Pacifica, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,735
Int. Cl. H04n *5/22, 5/78, 7/08*
U.S. Cl. 178—6.6 DD **12 Claims**



A system for selectively displaying discrete small portions of a large picture on a television monitor, with adjustable controlling means for continuously varying the boundaries of any one of the small portions being displayed. A cyclic disc buffer is provided for the reproduction of video signals. First and second images, each comprising a series of information and vertical retrace lines, are recorded as separate video frames on first and second tracks of a buffer disc so that the first information line of the second image corresponds in time to the

first retrace line of the first image. The buffer includes first and second transducers associated respectively with the first and second tracks of the disc. The transducers are connected through a high speed matrix switch to a standard television monitor. The switch forms part of the adjustable controlling means and is adapted to alternatively connect the first and second transducers to the television monitor for directly switching the image output of the television monitor between the last information line of the first image and the first information line of the second image.

3,697,679

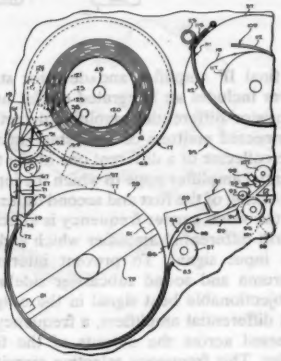
AUTOMATIC THREADING VIDEO RECORDER

Richard Allen Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed July 1, 1970, Ser. No. 51,447

Int. Cl. G03b *1/58*; G11b *15/66*; H04n *5/78*

U.S. Cl. 178—6.6 A **13 Claims**



A video tape is automatically threaded from a supply means such as a tape cartridge or cassette about a video scanner and past appropriate sound, control track and erase heads to a take up means. Preferably, a stripping means is effective to strip a leader from a tape cartridge having coiled video tape therein and feed the leader to the take up means. The video tape attached to the leader is preferably threaded at operational speed and with operational tension by a tape capstan and pressure roller means which is automatically disabled when the video tape is threaded.

3,697,680

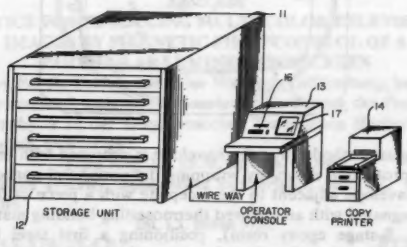
STORAGE AND RETRIEVAL SYSTEM

Wayne D. Anstin, Cupertino, Calif., assignor to Varian Adco, Palo Alto, Calif.

Filed Feb. 2, 1970, Ser. No. 7,884

Int. Cl. B65g *1/06*

U.S. Cl. 178—6.8 **23 Claims**



Documents or information in the form of microfilm or other permanent form are mounted on rectangular frames or carriers which are edge coded by notching. A plurality of carriers are stored in one or more elongated storage bins with the bins arranged side-by-side. An electromechanical carriage is adapted to move to a selected bin and then to move over the selected bin to store or retrieve carriers. During retrieval, the coded edges are scanned and an electrical control starts a retrieval cycle to retrieve the carrier having the desired document. The carrier is transported to a display location where the document or information is read and made available for use as a display, hard copy, or video signal. The electrical control includes a memory which remembers the bin location of each carrier whereby the bin containing the desired carrier is selected and scanned to locate the desired carrier. In refiling, the bin from which the carriers were removed is selected and the carriers are filed sequentially in open locations.

3,697,681

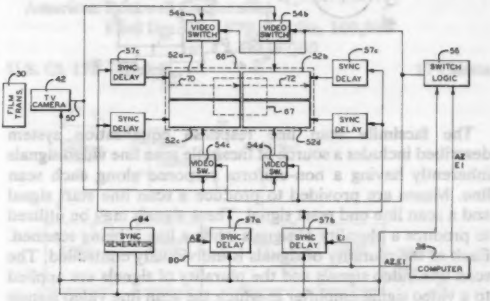
PLACEMENT OF IMAGE ON MATRIX DISPLAY

Reginald F. H. McCoy, Highland Park, Ill., assignor to The Singer Company, New York, N.Y.

Filed Aug. 25, 1970, Ser. No. 66,729

Int. Cl. H04n *3/16*; H01j *29/89*

U.S. Cl. 178—6.8 **2 Claims**



Apparatus which will provide, to a visual display comprising a plurality of scanned raster devices such as television monitors arranged to form a continuous display, a means of placing a high resolution image, which may be larger than the size of one device or monitor but smaller than the size of the total display, in a controlled position on one or more of the monitors in a manner such that the image will appear to be continuous from one monitor to another.

3,697,682

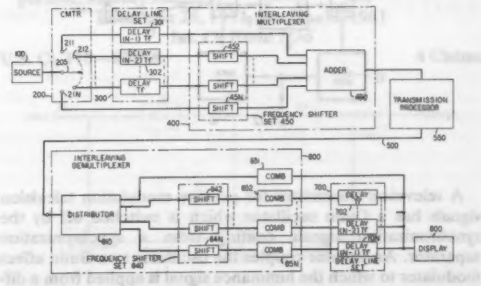
VIDEO SIGNAL PROCESSING

Anthony David Berg, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 11, 1971, Ser. No. 152,168

Int. Cl. H04n *7/12*, *7/06*

U.S. Cl. 178—6.8 **9 Claims**



A television picture is scanned such that each frame of the resultant video signal comprises a succession of N interlaced

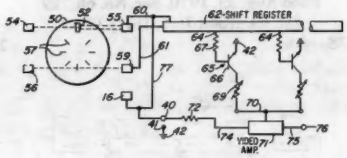
fields. Each field is then delayed by a time equal to the field scan time multiplied by the factor (N-I), where I represents its ordinal place in the succession. The fields, which thus coexist in time, are then interleaved in the frequency domain. The video signal is thereby compressed by a factor of N on a frame-by-frame basis, and additional data can be time multiplexed between the compressed frames. Alternatively, the bandwidth of the signal can be reduced by stretching the time-compressed frames.

3,697,683

FACSIMILE SCAN LINE RESPONSE EQUALIZATION SYSTEM

Percival T. Gates, Jr., Weston, Mass., and Albert H. Libbey, Moultonboro, N.H., assignors to EG & G, Inc., Bedford, Mass.

Filed Dec. 7, 1970, Ser. No. 95,664
Int. Cl. H04n *1/40*
U.S. Cl. 178—7.1 **8 Claims**



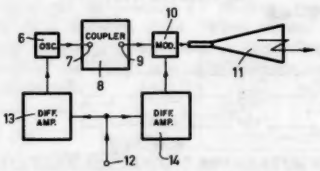
The facsimile scan line response equalization system described includes a source of facsimile scan line video signals inherently having a non-uniform response along each scan line. Means are provided to produce a scan line start signal and a scan line end reset signal. These signals may be utilized to produce a plurality of signals while a line is being scanned. Each of the plurality of signals is individually controlled. The scan line video signals and the plurality of signals are applied to a video signal amplifier in which the scan line video signals are controlled in accordance with the individually controlled plurality of signals.

3,697,684

TELEVISION TRANSMITTER WITH THE SYNCHRONIZATION SIGNAL APPLIED TO THE OSCILLATOR AND THE LUMINANCE SIGNAL APPLIED TO A MODULATOR

Paul Lesartre, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,522
Claims priority, application France, Oct. 31, 1968, 68172256
Int. Cl. H04n *5/40*
U.S. Cl. 178—7.2 **6 Claims**



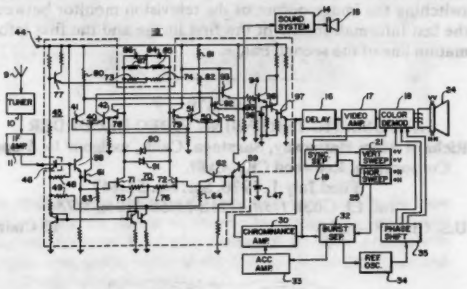
A television transmitter for positive modulation television signals has a Gunn oscillator which is switched off by the synchronization signals coming from a synchronization separator. An isolator couples the oscillator to a Gunn effect modulator to which the luminance signal is applied from a difference amplifier. Therefore, the inability of the modulator to produce zero output during the sync pulses is overcome.

3,697,685

SYNCHRONOUS AM DETECTOR

Gerald K. Lunn, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 13, 1970, Ser. No. 27,668
Int. Cl. H04n *5/44*; H03d *1/22*
U.S. Cl. 178—7.3 R **10 Claims**



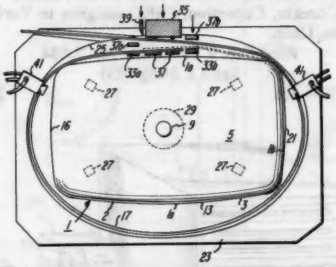
A combined final IF amplifier and detector stage for a television receiver includes an integrated circuit having first and second transistor differential amplifier detector stages, the common-connected emitters of each stage of which are coupled with the collector of a different one of the transistors of a third differential amplifier stage to which the input signals are supplied. Switching of the first and second differential amplifier stages at the video carrier frequency is effected under control of a fourth differential amplifier which is driven into limiting by the input signal. To prevent intermodulation between the chroma and sound subcarrier sidebands from producing an objectionable beat signal in the output of the first and second differential amplifiers, a frequency selective circuit is connected across the outputs of the fourth differential amplifier. This frequency selective circuit peaks at the video carrier frequency and includes a notch at the chroma subcarrier frequency.

3,697,686

CATHODE RAY TUBE IMPLOSION PROTECTION SYSTEM AND METHOD

Arnis Hildebrants, Jonesboro, Ind., assignor to RCA Corporation

Filed Oct. 27, 1970, Ser. No. 84,413
Int. Cl. H01j *27/06*
U.S. Cl. 178—7.82 **3 Claims**



A glass cathode ray tube envelope is provided with implosion-protection means by wrapping the peripheral portion of the envelope adjacent to the faceplate with a piece of fabric impregnated with an uncured thermosetting bonding material (e.g., B-stage epoxy resin), positioning a first steel band around the tape, heating about two-thirds of the band to 200°–250° c., contacting the tape with the band while hot, to bond the tape to the glass envelope and band along about two-

thirds of the periphery of the envelope, and tensioning and permanently mounting the band on the envelope by welding the ends together under tension while still hot so that, on cooling, the band tension is increased to a large value, e.g., 1,500 pounds, and then mounting a second steel band on the first band in the same manner as the first band but with the band joint on the opposite side of the envelope, to bond the tape to the envelope and first band along the remaining portion of the periphery thereof.

3,697,687

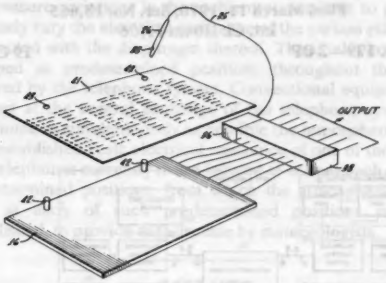
ENCODING DEVICE

Harry T. Larson, 18521 Embury Drive, and Richard T. Loewe, 12882 Olympic Way, both of Santa Ana, Calif.

Filed Dec. 16, 1970, Ser. No. 98,551

Int. Cl. H04n 1/00

U.S. Cl. 178—18 **35 Claims**



A device for digitally encoding the position of a selected point location, the device comprising a foundation member having at each of a plurality of point locations a unique combination of conductive members, not necessarily exposed representing a code combination of the elements of a code system, such as a binary code. At least one probe in the form of an electrode is arranged to be brought into registry and proximity but not into actual contact with the conductive members at an assigned one or any of a plurality of the point locations of the combination of members. All of the conductive members that pertain to the same element level of the code are connected together and to a register or other utilization device. Following the positioning of the probe it is energized to impress an electrostatic charge on those of the conductive members with which it is in registry. The utilization devices respond to these charges, and thus a discrete code combination is generated.

3,697,688

DEVICE FOR PRODUCING MULTI-COLOR TELEVISION IMAGES BY MAGNETIC FIELD CONTROL OF A PARTICULAR LUMINESCENT SCREEN

Georg Busch, Zurich, and Peter Wachter, Zollikerberg, both of Switzerland, assignors to Verein zur Forderung der Festkorperphysik an der Eidgenossischen Technischen Hochschule, Zurich, Switzerland

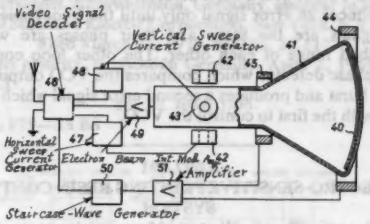
Filed Aug. 12, 1970, Ser. No. 63,044

Claims priority, application Switzerland, Jan. 21, 1966, 993/66

Int. Cl. H04n 9/22

U.S. Cl. 178—5.4 R **8 Claims**

A device for the production of multi-colored TV images by a temporal sequence of monochromatic images corresponding to various color records of the original image to be transmitted in which a picture screen is made of a substance capable of luminescence forming the picture screen, a magnetic chemical compound with a magnetic field influencing the substance and



means for the step-by-step change of the magnetic field in dependence on color control information contained in the TV signals.

3,697,689

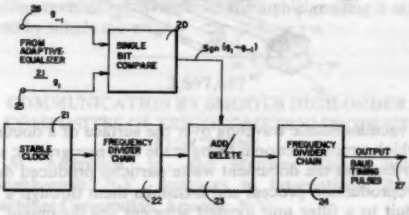
FINE TIMING RECOVERY SYSTEM

Earl D. Gibson, Hunting Beach, Calif., assignor to North American Rockwell Corporation

Filed Dec. 23, 1970, Ser. No. 100,990

Int. Cl. H04l 7/00

U.S. Cl. 178—69.5 R **17 Claims**



The present receiver timing system utilizes the difference signal between two tap gain adjustments of an automatic adaptive equalizer as a timing control signal. A stable clock and frequency divider chain in the receiver generate a train of timing pulses. The timing control signal derived from the equalizer taps drives and ADD-DELETE circuit, which is placed in the frequency divided chain, to lock the generated timing pulse train to the received signal.

3,697,690

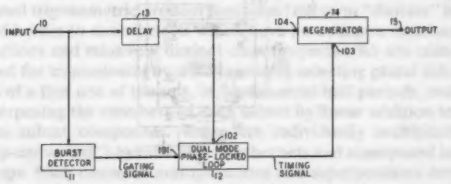
DUAL-MODE PHASE-LOCKED LOOP WITH DEAD ZONE PHASE DETECTOR

Marvin Robert Aaron, Fair Haven, Monmouth County; Warren Gail Hammett, Middletown, Monmouth County, and James Francis Oberst, Howell Twp., Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1971, Ser. No. 157,961

Int. Cl. H04n 1/36

U.S. Cl. 178—69.5 R **4 Claims**



A timing circuit generates the timing signal used in the regeneration of a pulse code modulation signal which contains

a timing burst between each word. This is accomplished by synchronizing a voltage-controlled oscillator (VCO) to the timing burst with a dual-mode phase-locked loop. One loop contains a phase detector with a dead zone, which compares the VCO output with a burst detector signal. This phase detector produces an error signal only until the frequencies of the two signals are the same and their phases are within a prescribed range of each other. The other loop contains a gated phase detector which compares the VCO output to the timing burst and produces a second error signal which is combined with the first to control the VCO.

3,697,691

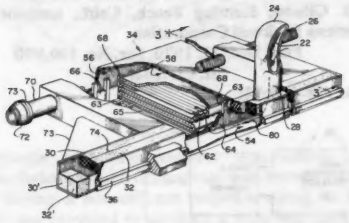
ELECTRO-SENSITIVE PRINTING RESIN CONTROL SYSTEM

Eric A. von Hippel, Weston, Mass., assignor to Graphic Sciences, Inc., Danbury, Conn.

Continuation of Ser. No. 747,001, July 23, 1968, abandoned. This application May 3, 1971, Ser. No. 139,890

Int. Cl. H04l *15/24*

U.S. Cl. 178—94 **13 Claims**



A vacuum nozzle traveling over the surface of a document on which a reproduction is being made by a pyrographic stylus removes from the document waste particles produced during the reproduction process and transmits them through a rigid conduit to a filter unit located adjacent the document. The filter unit has a pair of deformable resilient foam slabs positioned in side-by-side abutting relationship on one of its walls to form an extended air-tight seal through which the coupling conduit enters the filter unit. As the nozzle moves over the surface of the document, the conduit moves along the length of the filter unit and the foam slabs continuously deform and reform snugly around the conduit as it moves to thereby maintain the vacuum within the filter unit.

3,697,692

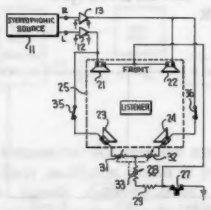
TWO-CHANNEL, FOUR-COMPONENT STEREOPHONIC SYSTEM

David Hafler, Merion Station, Pa., assignor to Dynaco Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 35,018, May 6, 1970. This application June 10, 1971, Ser. No. 151,790

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 G **20 Claims**



A two-channel stereo signal including left and right channel responses (L and R, respectively), deriving from only two amplifiers, is fed to four speakers located approximately at the corners of a quadriliateral area, and are positioned to face toward the interior of the area. The network drives the speakers with four different signals so that sound from the speakers appears to a listener positioned interiorly of the area to come from the four sides of the area, rather than from the four corners. In one embodiment, speakers in the left and right front corners respond to $(L+R/2$ and $(R+(L/2)$, respectively, while in a second embodiment these speakers respectively respond to (L) and (R), respectively. Speakers in the left and right rear corners (directed toward the listener's back) respond to signals proportional to $L-(R/2)$ and $R-(L/2)$, respectively.

3,697,693

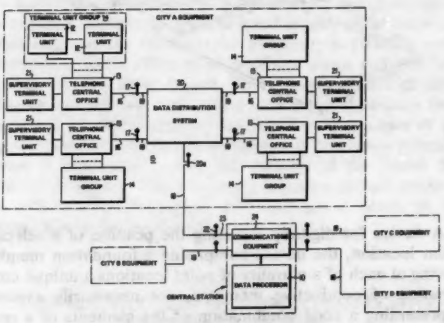
SYSTEM FOR MAINTAINING THE STATUS OF CREDIT ACCOUNTS

Raymond J. Deschenes, and Robert N. MacDonald, both of Atlanta, Ga., assignors to Data Card Corporation, Minneapolis, Minn.

Filed March 11, 1970, Ser. No. 18,665

Int. Cl. H04m *11/06*

U.S. Cl. 179—2 DP **19 Claims**



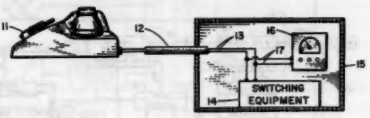
A system is disclosed for maintaining an up-to-date record of credit accounts, and for determining the status of an account prior to completion of a credit transaction to be billed to that account. Upon completion of each credit transaction the system automatically enters information pertinent to the transaction into the appropriate account record maintained at a central data processor station. This continual updating of each credit account as transactions occur makes the current status of any account available immediately upon inquiry by an authorized user of the system. Remote terminal units advantageously located at specified points of sale in each authorized user's facility are utilized to transmit inquiries regarding the status of credit accounts, and to receive replies authorizing or rejecting the transaction for which the inquiry was made.

The system includes a multiplicity of the terminal units, a plurality of supervisory data units each associated with a group of the terminal units, a central data processor station with special purposes or general purpose computers implemented or programmed to manipulate stored data on command from the remote terminal units or from the supervisory data units, and a network for communication between the central data processor station and the remote terminal units and supervisory data units.

3,697,694
TELEPHONE SYSTEM INCLUDING ATMOSPHERIC PRESSURE TELEMETERING MEANS

Norvel P. Tyler, 714 Roland Drive, Norfolk, Va.

Continuation-in-part of Ser. No. 61,871, Aug. 7, 1970, abandoned. This application Oct. 5, 1971, Ser. No. 186,703
Int. Cl. H04m *1/00*
U.S. Cl. 179—2 R 4 Claims

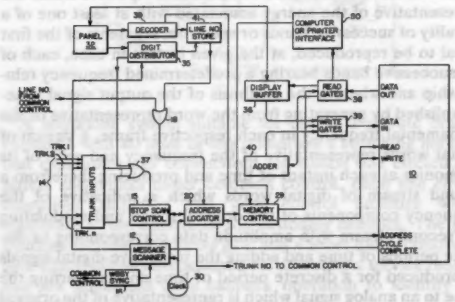


A telephone system including certain telephones equipped with a handset transmitter component responsive to barometric pressure variations in the ambient atmosphere to proportionately vary the electrical resistance of the carbon pile interconnected with the diaphragm thereof. These telephones are grouped at predetermined positions throughout the area covered by the telephone system. Conventional equipment is utilized at the central exchange of the telephone system to determine as simultaneously as possible the atmospheric pressure established basic electrical resistance of one of these certain telephones currently in use located at or near each of such predetermined positions, from which the atmospheric pressure at each of such predetermined positions may be established, to provide data useable by meteorologists.

3,697,695
CALL METERING FOR TELEPHONE EXCHANGE

Uwe A. Pommerening, 251 Raphael Drive, and Stanley L. Russell, 649 Beverly Drive, both of Webster, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,388
Int. Cl. H04m *15/38*, *15/10*
U.S. Cl. 179—7 MM 4 Claims

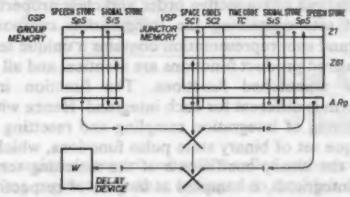


A call metering system for a telephone exchange having a computer type memory in which each line to be metered is assigned a separate address. A scanner scans the lines at high speed, and stops when it reaches a marked line. The address to be charged is fed to one input of a comparator, and when this is done, another high speed scanner scans the memory. It stops when the comparator produces an identity signal indicating that the memory scanner is at the address assigned to the line to be charged. The number stored at that address in the memory is then fed to an adder, increased by one and re-inserted at the same address. The memory may be queried from a manually operated control station or automatically by a computer or printer.

3,697,696
METHOD FOR THE SIGNAL EXCHANGE IN TELECOMMUNICATION, PARTICULARLY TELEPHONE EXCHANGES EMPLOYING TIME-DIVISION MULTIPLEXING

Willi Verstegen, Kornwestheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed March 31, 1970, Ser. No. 24,117
Claims priority, application Germany, April 1, 1969, P 19 16 792.1
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS 7 Claims

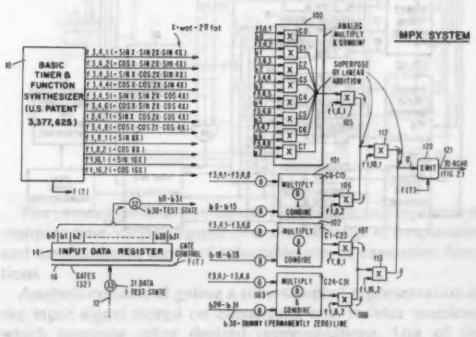


In a PCM-switching center the signals are exchanged between the highways in those time slots in which an exchange of speech is not necessary, i.e. in which synchronizing or signalling is effected on the highways. Thus the expenditure for the exchange of signals using lumped channel-bound signalling remains relatively low. Through-signalling is accomplished by simple means.

3,697,697
COMMUNICATION BY SMOOTH HIGH ORDER COMPOSITES OF TRIGONOMETRIC PRODUCT FUNCTIONS

Leo M. Audretsch, Jr., and Matthew Elsner, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,656
Int. Cl. H04j *1/08*
U.S. Cl. 179—15 BC 9 Claims



Member functions of certain disjoint sets of harmonically related trigonometric product functions (the term "disjoint" is used herein to describe sets which have no common member functions and relatively distinct class properties K) are combined for transmission by simultaneously selecting plural subsets of a first one of the sets, in fundamental half-periods, and superposing the members of each subset by linear addition to form subset composites. These are individually multiplied ("up-converted") by members of other sets and superposed in groups. Such cascaded multiplications and superpositions are continued convergently to provide at one central terminal a comprehensive high order composite transmission waveform which has smooth outline and contains, in a highly distin-

guishable form, all of the binary intelligence utilized in the initial selections of subsets of the first set. At receiving apparatus the composite transmission waveform is decomposed (down-converted) in divergently cascaded stages of multiplications by locally synthesized functions. Plural sets of higher order product waveforms, issuing from the last stages of such multiplication in parallel, are separately integrated over fundamental half-period intervals. The integrand functions correspond to distinct sums of products of pairs of high order trigonometric product functions having identical class and order. The terms of any sum all have distinct binary coefficients. The product functions form an orthogonal set with associated order and class properties respectively relating to sums and maxima of respective order and class properties of the disjoint sets containing the transmission components. Each integrand sum representation contains a unique term in which the paired product functions are identical and all other terms have unmatched functions. The function in the matching term is different for each integrand. Hence with appropriate timing of integration sampling and resetting functions a unique set of binary state pulse functions, which correspond to the binary coefficients of the matching terms of respective integrands, is sampled at outputs of respective integration stages. Normally these pulse functions correspond identically to the binary selection pulses utilized in the pre-transmission subset selections.

3,697,698

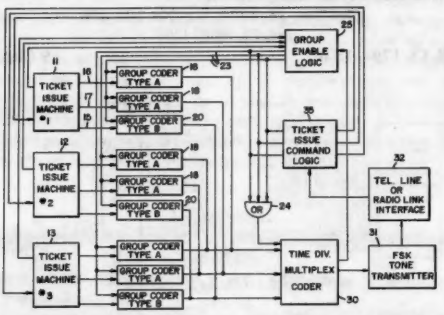
PARI-MUTUEL OFF-TRACK BETTING SYSTEM

Robert A. Oswald, P.O. Box 458, Gardnerville, Nev., and James R. Bull, 1940 Covina Drive, Sparks, Nev., assignors to said Oswald, by said Bull

Continuation of Ser. No. 829,964, June 3, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 165,843

Int. Cl. H01j *3/00*

U.S. Cl. 179—15 A **3 Claims**



An off-track betting system in which a plurality of ticket issuing machines at off-track locations permit selection and entry of input data comprising a proposed bet transaction and provide parallel output signals corresponding to the input data. The parallel output signals are encoded and sequentially gated in groups corresponding to respective ticket issuing machines. Each group of parallel output signals is thereafter multiplexed to provide a serial signal for transmission over a telephone line or radio link to a central pari-mutuel totalizer or computer at another location where multiplex decoders and logic gates process the signal for input to the totalizer or computer. Upon acceptance of a bet transaction by the totalizer, a return signal actuates the ticket issue machine to issue an appropriate ticket.

3,697,699

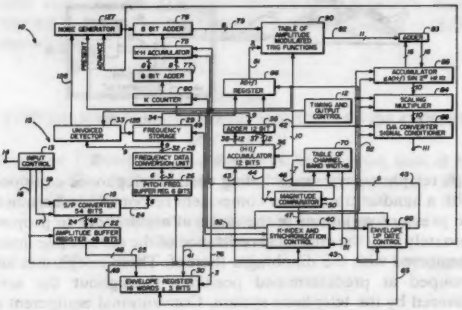
DIGITAL SPEECH SIGNAL SYNTHESIZER

Norman P. Gluth, and Richard A. Houghton, both of Dallas, Tex., assignors to LTV Electrosystems, Inc., Dallas, Tex.

Filed Oct. 22, 1969, Ser. No. 870,012

Int. Cl. G10l *1/10*

U.S. Cl. 179—1 SA **47 Claims**



Disclosed is an electrical-signal synthesizer for converting digitally coded information associated with at least one electrical signal, whose frequency, amplitude or phase may vary, to analog signals whose frequency, amplitude or phase varies in substantially the same manner as that of the at least one electrical signal. More specifically, the synthesizer is operative to convert a digital signal representative of a first analog signal, such as a voice signal, having varying parameters, such as frequency or amplitude, into an analog output signal which varies in substantially the same manner as the first signal, and where the digital signal is composed of consecutive frames of words, and one word of each frame is representative of a fundamental frequency associated with the first signal at an instant of time, and successive words in the respective frame are representative of the energy associated with at least one of a plurality of successive bands or spectrum segments of the first signal to be reproduced, at the given instant in time, each of the successive bands bearing a predetermined frequency relationship and wherein the synthesis of the output signal is accomplished by generating from the word representative of the fundamental frequency in each respective frame, a stream of digital words representative of the frequency and each of its harmonics at each instant of time and producing therefrom a second stream of digital words which is indicative of the frequency components of the original sound and modulating the second stream with amplitude data corresponding to discrete periods of time and adding the respective digital signals so produced for a discrete period of time and converting the same to an analog signal which is representative of the original voice signal.

3,697,700

LINE HUNTING CIRCUITRY FOR COMMON CONTROL COMMUNICATIONS SWITCHING SYSTEM

William Wallace Greason, III, Longmont, and David William Weiner, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

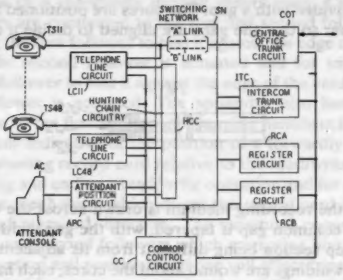
Filed Dec. 21, 1970, Ser. No. 100,315

Int. Cl. H04q *3/22*

U.S. Cl. 179—18 AB **8 Claims**

A telephone system suitable for use as a private branch exchange with 40 station and attendant lines or less is disclosed. It comprises a crossbar switching network that

establishes call connections for station lines, registers and trunks under common control. PBX line hunting circuitry is



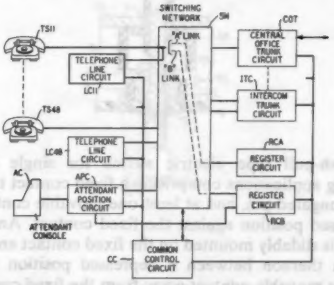
integrated into the electromechanical switching network with electronic hunting gate arrangements in a group of station line circuits.

3,697,701

IMPROVED SCANNABLE LINE CIRCUIT FOR COMMON CONTROL TELEPHONE SYSTEM

William Wallace Greason, III, Longmont, and David William Weiner, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 100,314
Int. Cl. H04q *3/22*
U.S. Cl. 179—18 FA **7 Claims**



A telephone system suitable for use as a private branch exchange with 40 lines or less comprises a switching network that establishes call connections for station line circuits, registers and trunks under common control. Each line circuit comprises amplifier and gate control facilities which cooperate in the control of the switching network. The gate facilities include an address gate and a zener diode controlled gate which initially are scanned for detecting a service request and are rescanned on a callback operation to identify the calling line following a dialing operation.

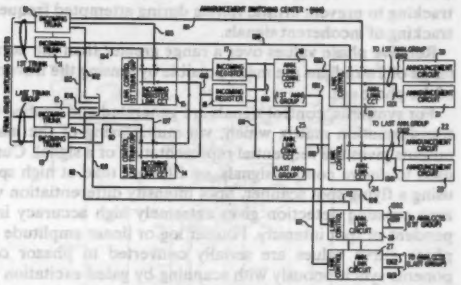
3,697,702

SELECTABLY CONTROLLABLE ANNOUNCEMENT SYSTEM

John J. Buonsante, Harrison, N.Y.; Lambert Freericks, Hasbrouck Heights, N.J.; Howard J. Haarmann, Floral Park, N.Y., and John C. Sieglinger, Short Hills, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,500
Int. Cl. H04m *3/42*
U.S. Cl. 179—18 B **26 Claims**

A central office switching center which is accessible by interoffice trunks from any of a number of other central office switching centers is arranged to return selected announcements to calling subscribers. An incoming register at the announcement central office is connected to an activated interoffice trunk and is arranged to receive the directory



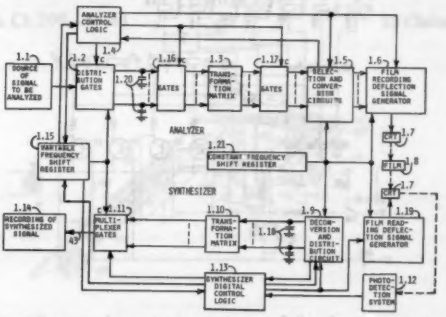
number uniquely associated with a called announcement. The incoming register is further arranged to establish an exclusive connection between the activated trunk and the called announcement circuit and to thereupon become disassociated from the connection.

3,697,703

SIGNAL PROCESSING UTILIZING BASIC FUNCTIONS

Melville Clark, Jr., Cochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark Associates, Cochituate, Mass.

Continuation-in-part of Ser. No. 733,470, May 31, 1968. This application Aug. 15, 1969, Ser. No. 857,271
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 SA **53 Claims**



The present invention relates to the analysis and synthesis of complex time-varying signals over a wide range of frequencies and amplitudes in terms of selectable sets of expansion functions.

Analysis consists of gating a time-sampled representation of the input signal stored on capacitors, into resistor matrices, which compute other desired representations. Use of the Fourier series representation in the analysis produces Fourier phazor components, which are converted to resultant vector amplitudes and phases by carrier generation through modulation by the phazors of 90°-out-of-phase, very high frequency, reference oscillators. Synchronous carrier demodulation gives resultant Fourier amplitudes. Carrier phase, relative to one of the reference oscillators, being equal to the Fourier phase, is determined by time (between zero crossings)-to-voltage conversion. Analyzer tuning may be external, voltage-controlled, or phase-controlled. When tuning is phase controlled, phase computing circuits lock the analyzer frequency to that of the input signal. The analysis bandwidth may be absolute- or voltage-controlled fractional, the latter being achieved by a variable-duty-cycle time-sampling-filter method. Frequency-

tracking-system control of the voltage for controlled fractional bandwidth gives the ability to analyze with narrow bandwidth while providing wide band frequency tracking. A slowly varying phase-time derivative, when present for an appropriate length of time, is used to test for input signal coherence. The test result is used to control frequency tracking to prevent erratic tuning during attempted frequency tracking of incoherent signals.

Relative phase values over a range greater than the normal range of 2π radians are made possible by sensing the traversals of the phase cut.

For synthesis, control signals are generated and applied to a transformation matrix which, via multiplexing of the matrix outputs gives the sequential representation of a signal. Curves used to derive control signals, on film are read at high speed using a flying spot scanner. Spot intensity differentiation with zero crossing detection gives extremely high accuracy independent of spot intensity. Fourier log or linear amplitude and phase curve values are serially converted to phazor components synchronously with scanning by gated excitation and gated dissipation of high Q LC resonant circuits. Appropriate final stage gating and filtering of the time-sample representation eliminates system transients and objectionable frequency components due to the quantization of the output signal.

3,697,704

CIRCUITS FOR PRIVATE AUTOMATIC TELEPHONE EXCHANGE SYSTEMS

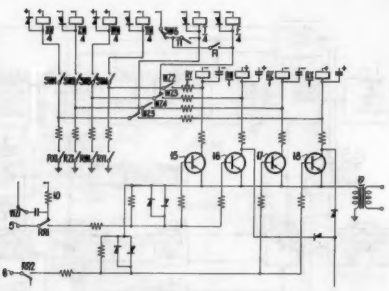
Michael Lawrence Jacobs, Earls Barton, England, assignor to The General Electric Company Limited, London, England

Filed Oct. 1, 1970, Ser. No. 77,096

Claims priority, application Great Britain, Oct. 2, 1969, 48,561/69

Int. Cl. H04q *1/38*

U.S. Cl. 179—86 **9 Claims**



A detector circuit for use in a private exchange using pushbutton controlled "leg-signalling," the circuit comprising four transistors different ones or combinations of which become conducting in response to currents resulting from the application of an alternating voltage to different combinations of terminations applied to the line wires by operation of respective pushbuttons at the extension. The combinations of terminations serve to indicate the digit values of the respective pushbuttons for the purpose of signalling to the exchange equipment the number of an extension to be called.

3,697,705

ELECTROMAGNETIC TRANSDUCER RECORDING HEAD HAVING A LAMINATED CORE SECTION AND TAPERED GAP

Norman I. Holt, Pasedena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 24, 1969, Ser. No. 844,315

Int. Cl. G11b *5/16, 5/24*

U.S. Cl. 179—100.2 C **5 Claims**

An electromagnetic transducer head is provided which exhibits a wide band recording response characteristic, and which comprises a plurality of separate magnetic head structures operating over different, overlapping frequency bands, and formed into an integral assembly. Each separate head structure of the assembly includes a magnetic core, and each core is provided with a gap. The cores are positioned adjacent one another so that the gaps are aligned to define a common

gap, and the recording medium is drawn across the common gap. The common gap is tapered, with the gap width of each aligned gap section being different from its adjacent section. Separate windings are wound about the cores, each having different numbers of turns so as to cover overlapping frequency ranges.

3,697,706

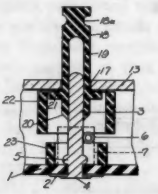
PUSH TYPE ELECTRIC SWITCH WITH CONTACT POST, MOVABLE COIL SPRING CONTACT AND INTERPOSED NON CONDUCTIVE PLUNGER

Leslie Huggard, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed June 23, 1971, Ser. No. 155,752

Int. Cl. H01h *9/26, 27/04*

U.S. Cl. 200—5 R **13 Claims**



A push-pull type electric switch for single or matrix switching applications comprising a fixed contact in the form of an elongated pin, and at least one movable contact biased to a closed position against the fixed contact. An insulative plunger is slidably mounted on the fixed contact and is axially movable thereon between a depressed position wherein it shifts the movable contact away from the fixed contact to an open position, and a retracted position wherein it permits the movable contact to assume its biased closed position against the fixed contact.

3,697,707

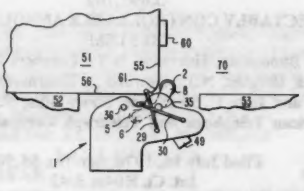
CARD POSITION SENSING APPARATUS

Kenneth Barnett Williams, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,678

Int. Cl. H01h *29/02*

U.S. Cl. 200—46 **14 Claims**



A card position sensing apparatus for sensing the position of a record card on a card deck relative to a read/write head. The

apparatus has a first follower and shunting member actuatable by the leading edge of a forwardly moving record card, and a second follower and shunting member actuatable by the leading edge of a rearwardly moving record card. Cooperating members are connected to the first and second followers for tripping the first follower to bias it against the edge of the card when the second follower is actuated and for tripping the second follower to bias it against the edge of the card when the first follower is actuated. The apparatus also has switches operable by the first and second shunting members for providing signals indicative of the position of a forwardly and rearwardly moving record card relative to the read/write head for beginning and ending a read/write operation and for activating the drive mechanism which drives the record card in the forward and rearward direction. The structural cooperation of the first and second followers which are spring biased is such that actuation and positioning of one will effect tripping of the other, providing very accurate sensing of the position of the card.

3,697,708

HOPPER MATERIAL SUPPLY INDICATOR

John I. Beresic, 2900 West Lincoln, Phoenix, Ariz.

Filed June 11, 1971, Ser. No. 152,278

Int. Cl. H01n *9/16*

U.S. Cl. 200—61.21 **8 Claims**

A supply indicator for measuring the level of granular material stored in a bin, tank, silo or the like wherein a series of vertically spaced sensing limit switches are placed in and arranged to extend outwardly of a longitudinal slot in a tubular metallic housing. The housing is arranged within and longitudinally of the bin, tank, silo or the like and employs a flexible cylindrical sleeve tightly fitted over the housing which is capable of actuating indicating devices in a continuous fashion to note the changes in the level of the material in the hopper.

3,697,709

BYPASS AND ISOLATION SWITCH

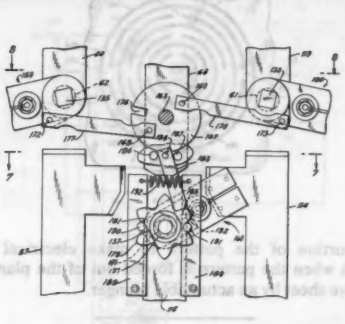
Dominik M. Witkor, Cranford, N.J., assignor to Automatic Switch Company

Filed Dec. 20, 1971, Ser. No. 209,514

Int. Cl. H01h *31/00*

U.S. Cl. 200—48 R **11 Claims**

A switch including three conductors for connection, respectively, to a normal power source, an emergency power source, and a load, as well as three conductors for connection to an automatic transfer switch. An isolating switch contact is located between each power source conductor and one of the transfer switch conductors, and a bypass contact is located between the load conductor and the third transfer switch conductor. Manually operable control means are provided for opening and closing the isolating switch contacts, and for positioning the bypass contact so that it engages either its respective transfer switch conductor or one of the power source conductors. An interlock forming part of the control means prevents opening of the isolating switch contacts unless the bypass contact is engaging one of the power source conductors. The interlock also prevents disengagement of the bypass contact from either power source conductor unless the isolating contacts are closed. The control means also includes means defining only a limited number of stable positions of the bypass contact.



3,697,710

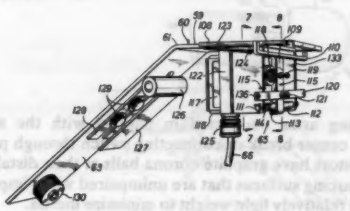
TRIGGER ASSEMBLY FOR ARTICLE CONVEYING MACHINE

Earl K. Jarrett, Corpus Christi, Tex., assignor to Clayton Specialties, Inc., Corpus Christi, Tex.

Division of Ser. No. 771,744, Oct. 30, 1968, Pat. No. 3,604,366. This application May 10, 1971, Ser. No. 141,501

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.41 **13 Claims**



In one exemplar form, a machine for conveying substantially flat articles such as pans containing bakery product dough pieces and for suitably manipulating the flat articles for any suitable purposes includes a trigger assembly for actuating the article manipulating means. The trigger assembly is readily adapted to be engaged by articles being moved by the conveying mechanism of the machine for achieving such manipulation and is also adapted for suitable movement responsive to particular positioning of the articles on the conveyor so that the trigger assembly does not interfere with efficient operation of the conveyor mechanism.

3,697,711

SNAP ACTION SWITCH

Elton E. Tetrick, Draper, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

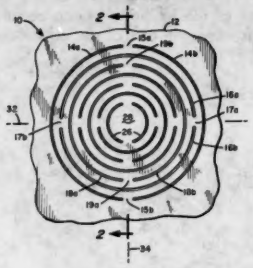
Filed June 29, 1971, Ser. No. 157,907

Int. Cl. H01h *13/48*

U.S. Cl. 200—67 DB **1 Claim**

An electromechanical switch that includes an electrically conductive sheet having a spring-like pattern of apertures

therethrough, a printed circuit electrical conductor and an apertured insulating spacer therebetween for permitting the



center portion of the pattern to make electrical contact therewith when the pattern is forced out of the plane of the conductive sheet by an actuatable plunger.

3,697,712

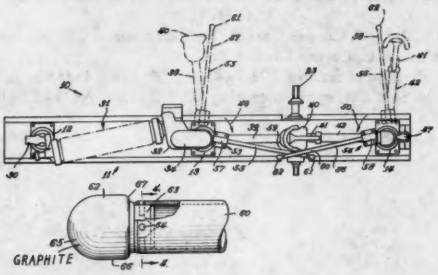
HIGH VOLTAGE SWITCH WITH PREINSERTION RESISTOR CONNECTED IN THE CIRCUIT THROUGH GRAPHITE CORONA BALLS

Leonard V. Chabala, Maywood, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Jan. 7, 1971, Ser. No. 104,550

Int. Cl. H01h *33/12*

U.S. Cl. 200—146 R **5 Claims**



Conducting arms connected in parallel with the switch blades of a center break disconnecting switch through pre-insertion resistors have graphite corona balls at their distal ends to provide arcing surfaces that are unimpaired when impinged by arcs and relatively light weight to minimize inertia.

3,697,713

ALTERNATE ACTION MECHANISM WITH DRIVING MEMBER MOVABLE OUT OF ENGAGEMENT WITH LATCHING CHANNEL IN UNLATCHED POSITION

Masao Ohkita, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

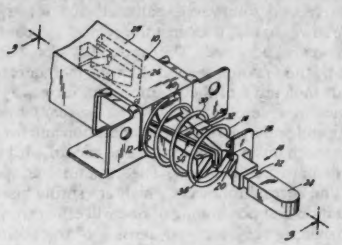
Filed Oct. 21, 1971, Ser. No. 191,327

Claims priority, application Japan, March 27, 1971, 46/18269

Int. Cl. H01h *13/56*

U.S. Cl. 200—153 J **16 Claims**

A pushbutton switch of the type actuated by a push-push motion of a control member is provided with a compact miniaturized structure having means to facilitate smooth operation with a minimum of frictional resistance and at the same time to provide a sharp and reliable switching action. The switch body is provided with a generally heart-shaped channel adapted to receive the upstanding end of a driving member which in turn is carried by a push rod slidable into and out of the switch body between its two operative positions. The channel is stepped to provide positive snap action switching and means are provided to impart a seesaw motion to the driving member, thereby to move the upstanding end thereof into positive camming engagement with the stepped upper surface of the channel, yet to maintain that upstanding end spaced from the upper surface of the channel over a substantial portion of its operating path.



Means are provided on the switch body for engaging the driving member first on one side and then at the other side of the pivotal support projection thereby to bias the upstanding end of the driving member into and out of engagement with the stepped channel surface as the push rod is moved between its two operative positions.

3,697,714

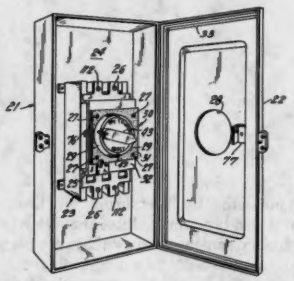
ROTARY HANDLE OPERATOR WITH REVERSIBLE COVER LATCH

Carl E. Gryctoko, Haddon Heights; Albert Strobel, Cherry Hill, both of N.J., and Kenneth D. Ball, Warminster, Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 28, 1971, Ser. No. 166,718

Int. Cl. H01h *3/10*

U.S. Cl. 200—172 A **10 Claims**



A handle mechanism for operating a molded case circuit breaker secured to the rear wall of an enclosure is mounted separate from the enclosure cover and extends through a cover opening to be operable from outside the enclosure when the cover is closed. The mechanism is constructed so as to be readily adapted for use with enclosure covers that are hinged at either side of the enclosure.

3,697,715

METHOD OF, AND APPARATUS FOR, BURN-FITTING WOODEN GUN STOCKS TO METAL RECEIVERS

Stephen J. Morris, North Haven, and James M. O'Keefe, Cheshire, both of Conn., assignors to The Marlin Firearms Co., North Haven, Conn.

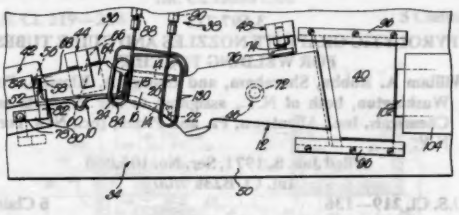
Filed June 4, 1971, Ser. No. 149,904

Int. Cl. H05b *5/08*

U.S. Cl. 219—10.43 **10 Claims**

Method of, and apparatus for, fully seating on a receiver end the ends of tangs on a wooden gun stock, of which the stock tangs are partially interprojected with receiver tangs on

the receiver end, and have excess wood interfering with their full interprojection with the receiver tangs, with the partially interprojected receiver and stock being placed in a holding fixture, and only part of the held receiver therein, including its



end, being subjected to high-frequency induction heating to stock-burning temperature, whereupon the stock is driven into full interprojection with the held receiver to the extent of a complete burn-fit of the stock tang ends with the receiver end.

3,697,716

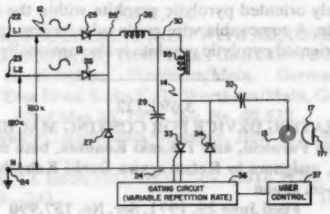
INDUCTION COOKING POWER CONVERTER WITH IMPROVED COIL POSITION

William P. Kornrumpf, Schenectady, N.Y., assignor to General Electric Company

Filed Nov. 19, 1971, Ser. No. 200,530

Int. Cl. H05b 5/04

U.S. Cl. 219—10.49 **11 Claims**



In a solid state cooking appliance for inductively heating a cooking utensil, the static power converter has a d-c power supply energized by a single phase, three-wire source than enables the use of the distribution system neutral as a continuously grounded d-c terminal. The induction heating coil in an inverter operated at ultrasonic frequencies is positioned in the circuit with the outer turn connected directly to the grounded neutral. Capacitively coupled leakage current in the utensil is reduced.

3,697,717

INDUCTION COOKING APPLIANCE WITH MULTICYLINDER POWER CIRCUITS

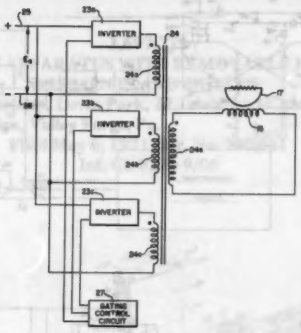
William P. Kornrumpf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company

Filed Nov. 19, 1971, Ser. No. 200,528

Int. Cl. H05b 5/04

U.S. Cl. 219—10.49 **11 Claims**

In a smooth-top cooking appliance for inductively heating cooking utensils, the individual outputs of a plurality of lower power rated solid state inverters are coupled by a transformer into a common secondary winding that supplies ultrasonic frequency power to the induction heating coil. The output



power of the multicylinder inverter is controlled to obtain a wide range of heating levels. One embodiment is used to synthesize a continuous sinusoidal output waveform.

3,697,718

METHOD FOR MANUFACTURING WELDED PIPES OR TUBES WITH HELICAL SEAM

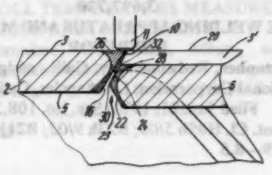
Dieter Von Hollen, and Heinz Holder, both of Dusseldorf-Rath, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Feb. 12, 1971, Ser. No. 115,020

Claims priority, application Germany, Feb. 13, 1970, P 20 07 668.0

Int. Cl. B23k 1/16

U.S. Cl. 219—62 **4 Claims**



Pipes are made from helically wrapped strips, having one edge uniformly bevelled, the other one roof shaped with h-f heating of the two edges, where one roof side faces the uniform bevel surface. This joint is pressure welded, and the resulting groove is filled by subsequent fusion welding without requiring removal of any burr from the groove.

3,697,719

PULSE NARROWING AND CUT-OFF PROTECTION SYSTEM FOR ELECTRICAL DISCHARGE MACHINING

Dalton R. Verner, Orchard Lake, and Ronald L. Syria, Utica, both of Mich., assignors to Elox Inc., Davidson, N.C.

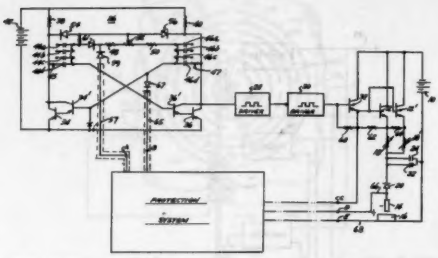
Filed March 10, 1971, Ser. No. 122,936

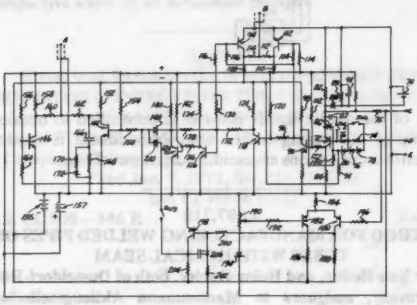
Int. Cl. B23p 1/08

U.S. Cl. 219—69 S **23 Claims**

A protection circuit is provided which senses and responds to gap short circuit condition during machining pulse on-time. Responsive to such condition, a machining current cut-off function is exercised by a complementary pair of electronic

switches which operate with positive action to control pulser operation by decreasing the "on" time of the pulser and decreasing off-time. An additional means is provided for ap-





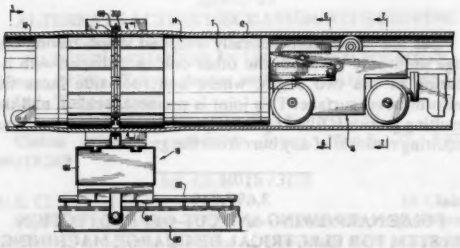
propriate limiting machining current by sensing gap open circuit condition during pulse on-time and correspondingly, through the operation of a complementary pair of electronic switches, increasing the "off" time of the pulser.

3,697,720

PIPE WELDING APPARATUS AND METHODS THEREFOR

John Christopher, Redwood City, Calif., assignor to Santa Fe International Corporation, Los Angeles, Calif.

Filed Jan. 21, 1971, Ser. No. 108,383
Int. Cl. H05b *5/00;* **B23k** *9/02;* **B21j** *13/08*
U.S. Cl. 219—8.5 **30 Claims**



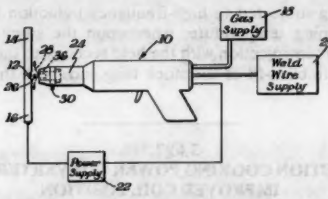
The pipe welding apparatus includes a longitudinally movable welding station, a longitudinally movable nest housing a traveller including a pipe aligner and expander and a traction assembly. A pair of pipe sections are butted one to the other and the welding station is displaced into alignment with the joint. The nest is moved to an end of a pipe section remote from the joint and the traveller moves from the nest through the pipe section to the joint. The pipe aligner and expander has a plurality of circumferentially arranged shoes which move radially outwardly to enlarge the butting end portions of the pipe sections and to draw the pipe sections axially toward one another when welding. The welding station includes an induction welder. Upon completion of the welding, the traveller returns to the nest.

3,697,721

PYROLYTIC GRAPHITE NOZZLES AND GUIDE TUBES FOR WELDING TORCHES

William A. Robba, Shoreham, and George A. Klasson, Port Washington, both of N.Y., assignors to Air Products and Chemicals, Inc., Allentown, Pa. and Pfizer, Inc., New York, N.Y.

Filed Jan. 8, 1971, Ser. No. 105,040
Int. Cl. B23k *9/00*
U.S. Cl. 219—136 **6 Claims**



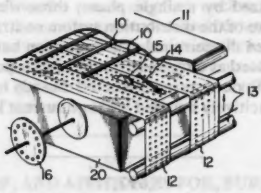
The removable nozzle for a gas-shielded welding torch is surfaced with pyrolytic graphite to prolong nozzle life and to render the inner surface thereof less adherent to weld splatter thereby facilitating cleaning. The pyrolytic graphite is oriented with a–b planes concentric with the nozzle axis. The surfacing may be accomplished by securing an insert of appropriately oriented pyrolytic graphite within the exit end of the nozzle. A removable wire guide tube having an outer surface of oriented pyrolytic graphite is also optionally provided.

3,697,722

HEATING DEVICE FOR COPYING MACHINES

Masayoshi Furuichi, and Takaaki Konuma, both of Tokyo-to, Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed June 29, 1971, Ser. No. 157,990
Claims priority, application Japan, June 30, 1970, 45/57066
Int. Cl. H05b *3/00*
U.S. Cl. 219—216 **4 Claims**

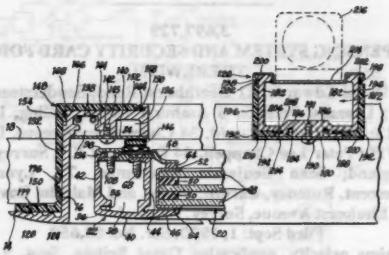


In a heating device for a copying machine comprising a conveyor for continuously conveying a copying paper and an electric heater for heating the copying paper a rotatable body is arranged to be rotated by the movement of the copying paper and means responsive to the rotation of the rotatable body for deenergizes the electric heater when the speed of the copying paper decreases to a value less than a predetermined value.

3,697,723
MULLION CONSTRUCTION FOR REFRIGERATOR DOOR FRAME

Robert J. Winsler, Elkton, Ky., and Fred A. Richter, Chicago, Ill., assignors to Ardco, Inc., Chicago, Ill.

Continuation of Ser. No. 5,392, Jan. 2, 1970, abandoned, which is a division of Ser. No. 611,020, Jan. 23, 1967, Pat. No. 3,499,245. This application Dec. 24, 1970, Ser. No. 101,384
Int. Cl. H05b *1/00*
U.S. Cl. 219—218 5 Claims

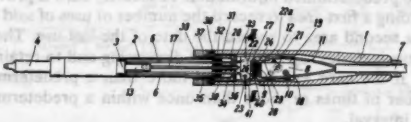


A mounting frame for a refrigerator door is disclosed, having a channel-shaped mullion with a front wall and a pair of side walls. Two angle-shaped insulating cover strips are mounted on the mullion. Each cover strip has a side leg covering one of the side walls thereof, and a front leg covering the adjacent portion of the front wall. A lip is provided on each side wall to retain the corresponding side leg. The front wall is formed with a pair of lips to retain the front legs. A cover plate, made of magnetic stainless steel or the like, is secured to the front wall so as to cover the front legs. The cover plate serves as an armature for a magnetic gasket on the door.

3,697,724
ELECTRIC SOLDERING IRON WITH ADJUSTABLE THERMOSTATIC TEMPERATURE CONTROL

Friedrich Hombrecher, Wertheim/Main, Germany, assignor to Ersa Ernst Sachs K.G., Wertheim/Main, Germany

Filed May 26, 1970, Ser. No. 40,532
Claims priority, application Germany, June 11, 1969, P 19 29 938.8
Int. Cl. H05b *1/02*; B23k *3/04*; H01h *37/46*
U.S. Cl. 219—241 10 Claims

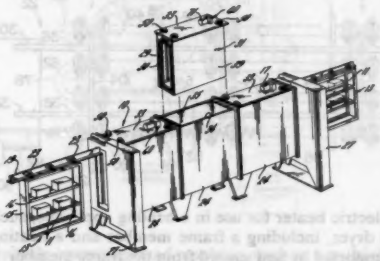


An electric soldering iron has a hollow handle connected to an outer tube in which there is a heating element operatively associated with a soldering tip and including a heating core fixed at the front end of the outer tube. A rod having a very low coefficient of thermal expansion is secured to the inner end of the heating core and extends into the hollow handle. A microswitch is oscillatably mounted in a unit in the hollow handle, and a pivotally mounted angle lever is also oscillatably mounted in the hollow handle and has a longer arm cooperable with the plunger of the microswitch. The shorter arm of this angle lever is engaged by the rod. The temperature setting of the soldering iron may be changed by adjustment of a screw, accessible from the exterior of the handle, and operative both on the microswitch and on the lever. The longer arm of the lever carries an abutment which is engageable with the microswitch at a point spaced substantially from the oscillating axis of the microswitch. In an alternative embodiment, adjustment of the temperature setting is effected by relative rotation of a handle element threaded onto the handle and cooperable with a temperature setting scale.

3,697,725
HEATING APPARATUS WITH REMOVABLE HEATING ELEMENTS AND SHIELDS

Irvin P. Bielefeldt, Loves Park, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed May 6, 1971, Ser. No. 140,661
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 5 Claims

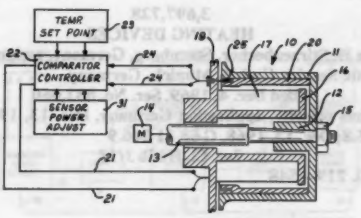


The heating elements and heat shields of a vacuum furnace are constructed as a unitary cartridge which may be removed easily from the outer vessel of the furnace to facilitate servicing of the heating elements and the heat shields and to reduce the down time of the furnace. A drive mechanism for advancing workpiece carriers through the furnace also is incorporated into the removable cartridge.

3,697,726
HEATED ROLL TEMPERATURE MEASUREMENT COMPENSATOR ASSEMBLY

Robert L. Geronime, Rosemount, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Sept. 17, 1971, Ser. No. 181,435
Int. Cl. H05b *1/02*
U.S. Cl. 219—469 8 Claims



A temperature measurement and control device for rotating heated rolls, such as those used in the fiber processing industry. The temperature sensor is stationarily mounted and positioned in a slot at one end of a rotating roll, and the sensor is used for controlling power to a heater utilized with the roll. The sensor thus is used to control the temperature of the roll surface. At high roll speeds the thermal coupling between the sensor and the roll is adequate, but at lower speeds that are encountered during the slowing down and stopping of the rolls,

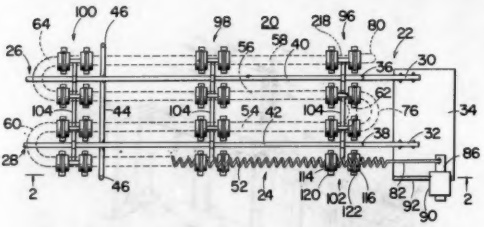
the thermal coupling between the roll surfaces and the sensor reduces in efficiency and the sensor conducts a large proportion of heat to its mounting structure. The present device utilizes passing a current through the sensor to self-heat the sensor to compensate for this decrease in thermal coupling and resultant stem conduction error.

3,697,727

OPEN COIL ELECTRIC HEATER

Charles E. Neuman, Delphos, Ohio, and Leland R. Shank, Angola, Ind., assignors to Ohio Decorative Products, Inc., Spencerville, Ohio

Filed July 2, 1970, Ser. No. 51,971
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **10 Claims**



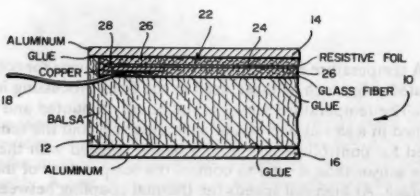
An electric heater for use in a heating appliance, such as a clothes dryer, including a frame member and a heating element supported by and spaced from the frame member. Spool insulators respectively are positioned to surround the heating element and yoke members are connected to the frame and respectively are adapted to receive and retain the spool insulators in snap-in relationship thereby supporting the heating element sections on the frame member. The heater is assembled by threading the spool insulators onto the heating element, arranging the insulators on the heating element in a desired pattern with the insulators respectively aligned with the yoke members of the frame member, and applying force to the insulators to cause the yoke members resiliently to receive and retain the insulator spools. The apparatus for assembling the heater comprises a member respectively having grooves therein for holding the heating element and the spool insulators in a position which allows the frame to be disposed over the assembly member with the yoke members aligned with the spool insulators. A compressive force may then be applied between the member and the frame thereby causing the spool insulators to be resiliently received and retained by the yoke members of the frame.

3,697,728

HEATING DEVICES

George H. Stirzenbecher, Starnberg, Germany, assignor to Air Plastic Service GmbH, Munich, Germany

Filed Dec. 4, 1969, Ser. No. 882,060
Claims priority, application Germany, Dec. 13, 1968, G 68 11 245.8; Dec. 13, 1968, G 68 11 246.9
Int. Cl. H05b *3/18*
U.S. Cl. 219—548 **1 Claim**



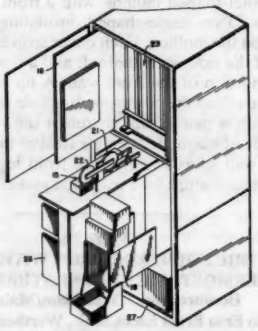
An airplane heating device. The device constitutes a light weight panel which generates heat uniformly over a broad area through the use of a heating foil composed of a flexible substrate coated or impregnated with a resistive material such as carbon particles in a resinous matrix. The foil is, in turn, embedded in a resinous-impregnated electrically nonconductive flexible substrate to form a sheet. The sheet is disposed on a light weight stiff panel of a material such as balsa or rigid foam to form a subassembly that is sandwiched between thin protective covers such as metal or plastic sheets. The heating panel can be used as a wall or floor heating plate in an airplane or as a component of a container-type airplane heating device such as a portable hotplate stove.

3,697,729

DISPENSING SYSTEM AND SECURITY CARD FOR USE THEREWITH

John David Edwards, 21 Heathhurst Road, Sanderstead, Surrey; Leonard Perkins, 3 Amhurst Gdws., Ealing, London W13; John Henry Donald, 34 Chamberley Avenue, London SW20; Peter Lee Chappell, 24 Doodcrest K I, Surrey, all of England; Sean Benjamin Newcombe, 73, Lynnmouth Crescent, Rumney, Cardiff, Wales, and Malcolm David Roe, 22 Elmhurst Avenue, Surrey, England

Filed Sept. 1, 1970, Ser. No. 68,650
Claims priority, application Great Britain, Sept. 9, 1969, 44,452/69
Int. Cl. G06k *7/10*; G07f *1/06, 11/00*
U.S. Cl. 235—61.7 B **21 Claims**



Apparatus for dispensing items desired by the user in response to the introduction of a valid security card and additional predetermined information. The apparatus includes means for reading data from the security card, keyboard means for introducing additional information and electronic logic for determining the validity of the card and the validity of the predetermined information. A security card is provided including a first area to record the number of uses of said card and a second area to record the date of the last use. The apparatus includes logic to prevent dispensing and to retain the card if the card has been used more than a predetermined number of times or more than once within a predetermined time interval.

3,697,730

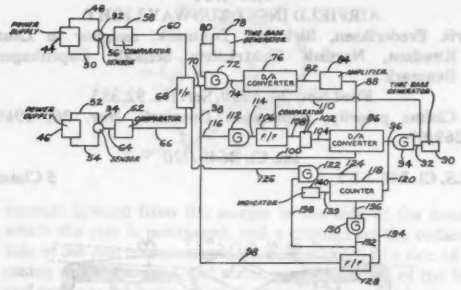
APPARATUS TO PRODUCE DATA COUNT SIGNALS

Peter Joseph Clack; James David Wiswell, and Anton Hubert Clemens, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 26, 1971, Ser. No. 119,263
Int. Cl. G06m *3/08*
U.S. Cl. 235—92 MT **5 Claims**

Apparatus to produce data count signals in a form equivalent to $C/n \pm C'$, wherein n is a variable and C and C' are constants is described comprising a source of an initiating signal, a source of a terminating signal, a first time-base generator, a first gated digital/analog convertor, an amplifier, a second time-base generator, a gated counter and a circuit

component for adding or subtracting a desired number of pulses to the gated counter. The two signal sources, the first time-base generator, and the first convertor are connected so that the pulses accumulated in the first convertor between the initiating signal and the terminating signal are directly proportional to *n*. The amplifier is connected between the first and second convertors so as to apply an amplified reference signal to the second convertor which is directly proportional to *n*.



The two signal sources, the second time-base generator, the second convertor, the counter and the comparator are connected so as to produce an output signal in the counter directly proportional to C/n. The component for adding or subtracting pulses is connected to the counter so that the counter output is directly proportional to $C/n \pm C'$. This apparatus is especially useful to measure specific gravity of liquids by the falling drop method.

3,697,731

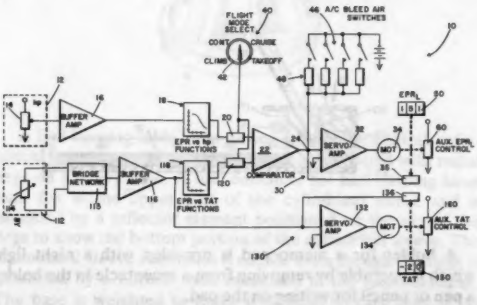
METHOD AND APPARATUS FOR DETERMINING MAXIMUM ALLOWABLE JET ENGINE PRESSURE RATIOS

James L. Kempema, Grandville, and Ralph W. Foard, Grand Rapids, both of Mich., assignors to Lear Siegler, Inc.

Filed Feb. 17, 1969, Ser. No. 799,810

Int. Cl. G06g 7/70; G01l 5/13

U.S. Cl. 235—150.2 **9 Claims**



An instrument comprised of inputs for receiving signals proportional to aircraft pressure altitude and compressor inlet temperature, which are coupled to function generators that produce outputs respectively representative of maximum engine pressure ratio at such altitude and at such temperature conditions, comparator means for receiving the functions so generated and selecting the one representative of the lowest allowable engine pressure ratio at such conditions, and a servo drive for a visual readout display of maximum engine pressure ratio. The instrument also includes system inputs for modifying the result to be displayed, in accordance with different flight modes of the aircraft, and also in accordance with compressor bleed air tapped from the engine for use in auxiliary aircraft systems.

3,697,732

MULTIPLE OPERATING HEAD MACHINES, PARTICULARLY MULTIPLE SPINDLE TEXTILE SPOOLING MACHINES WITH SUPERVISORY OPERATING TIME INDICATOR

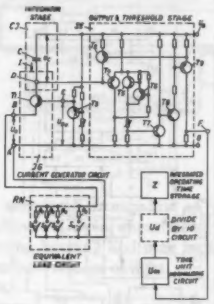
Walter Duss, Bach, Switzerland, assignor to Siegfried Peyer, Bach, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,303

Claims priority, application Switzerland, Jan. 14, 1970, 479/70

Int. Cl. G06f 15/46

U.S. Cl. 235—151.3 **8 Claims**



A multiple operating head machine, such as a multiple spindle textile spooling machine has apparatus connected thereto to determine the operating overall efficiency of the machine by analyzing the down-time of individual spindles. Each spindle is connected to a switch which is closed when the spindle is operating, placing a resistance in series with the switch. All switches of all spindles are connected in parallel so that, when all spindles are operating an equivalent resistance is placed in a time integrating and pulse generating circuit, the pulse sequence of which supplies an indication of the integrated overall operating time of the spindles of the machines.

3,697,733

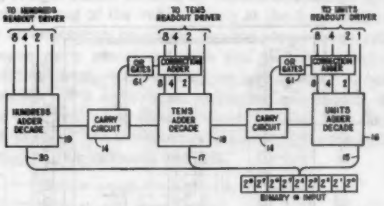
HIGH SPEED DIRECT BINARY TO BINARY CODED DECIMAL CONVERTER AND SCALER

Pierce C. Toole, Cocoa, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 16, 1970, Ser. No. 98,772

Int. Cl. G06f 5/02

U.S. Cl. 235—155 **3 Claims**



A high speed apparatus for scaling and converting binary numbers of binary coded decimal numbers which includes a plurality of decades connected in cascade. A plurality of programmed boards are provided for receiving binary numbers of predetermined weights and scaling the numbers up a predetermined multiple thereof. Interposed between each of said decades is a carry circuit. A carry circuit supplies carry numbers to the succeeding decade, plus it sends a corrector number back to a corrector circuit associated with the preceding decade. This corrector number is combined with binary

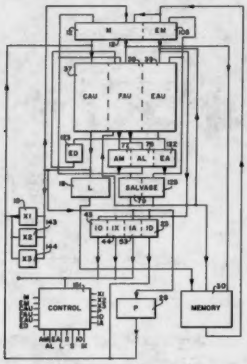
numbers already stored in the corrector circuit to produce a proper signal on a readout device associated therewith.

3,697,734

DIGITAL COMPUTER UTILIZING A PLURALITY OF PARALLEL ASYNCHRONOUS ARITHMETIC UNITS

William C. Booth, Reisterstown, Md., and Leslie T. Kyser, Binghamton, N.Y., assignors to The Singer Company, New York, N.Y.

Filed July 28, 1970, Ser. No. 58,970
Int. Cl. G06f 7/48
U.S. Cl. 235—164 18 Claims



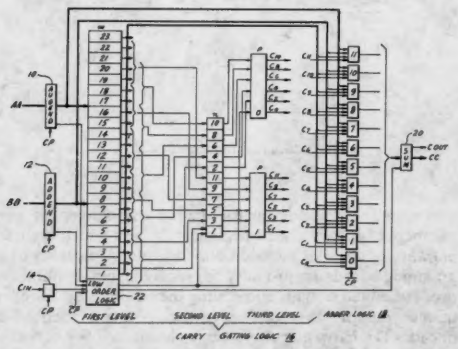
A digital computer in which the overall speed of operation is increased above that of other present-day computers. This increase in the speed of operation is achieved by (a) the utilization of flow-through devices in the arithmetic units, and (b) dividing the arithmetic units into several parts to handle the arithmetic modifications of control words, arithmetic modifications of fractions, and arithmetic modifications of exponents simultaneously. The control functions of this computer are clock-controlled, but the memory may be any random access or sequential memory. The logical design of the overall system is arranged to accomplish the desired objects of high speed.

3,697,735

HIGH-SPEED PARALLEL BINARY ADDER

Lawrence G. Hanson, Temple City, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 22, 1969, Ser. No. 843,524
Int. Cl. G06f 7/385, 7/38
U.S. Cl. 235—175 6 Claims



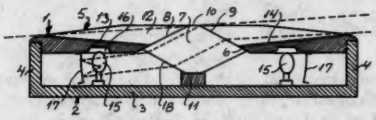
There is described a parallel adder for operands of 48 bits in which the carry information is generated simultaneously for all orders. The carry logic, consisting entirely of AND gates, is arranged in three levels. The adder consists of independent subadders of four orders each. The carry logic and subadders combine to form a maximum of four cascaded gate levels for generating the sum of any order of bits. Duplicate true and false logic is used at all levels. The second and third levels of the carry logic are arranged in an interleaved configuration to limit fanning.

3,697,736

AIRFIELD INSET RUNWAY LIGHT

Erik Frederiksen, Birkerod, Denmark, assignor to Laur. Knudsen, Nordisk Elektricitets Selskab, Copenhagen, Denmark

Filed Nov. 24, 1970, Ser. No. 92,353
Claims priority, application Denmark, Nov. 26, 1969, 6269/69
Int. Cl. B64f 1/20
U.S. Cl. 240—1.2 5 Claims



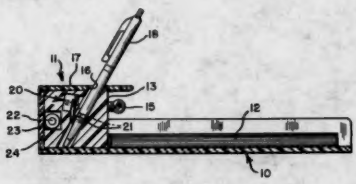
In an airfield inset runway light a prism of substantially rhombic cross section is mounted in a housing with the major axis of the rhomb in substantially horizontal position and the prism is illuminated from two sides below the major axis in order to radiate rays from the upper surfaces of the prism so that the radiated rays form a small angle with the horizontal direction.

3,697,737

NOTE PAD HOLDER WITH NIGHT LIGHT

Henry S. Levkoff, 1 Carlton Road, Great Neck, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,571
Int. Cl. F21v 33/00
U.S. Cl. 240—6.4 B 1 Claim



A holder for a memo pad is provided with a night light which is operable by removing from a receptacle in the holder a pen or pencil for writing on the pad.

3,697,738

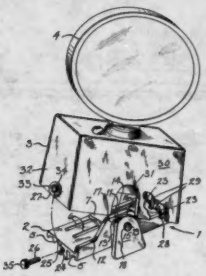
WARNING LIGHT HOUSING

Wilton K. Decker, Port Washington, Wis., and Valere F. Van De Velde, 601 South Illinois, Villa Park, Ill., assignors to said Van De Velde, by said Decker

Filed March 2, 1971, Ser. No. 120,243
Int. Cl. F21l 3/00
U.S. Cl. 240—10.6 6 Claims

A housing for an electric warning light comprising a base functioning as a platform to support batteries, a casing enclosing a region above the base, and a lens and lamp assembly atop the casing. The casing attaches to the base by a pivoted con-

nection, which allows for speedy separation of the two members, and the base is a cantilevered member with an upstanding pier at one side from which the housing is supported by a through bolt protruding from the pier. A relatively thin shroud



extends upward from the margin of the side of the base at which the pier is positioned, and a channel on the outboard side of the pier complements an arcuate notch in a side of the casing to form a wind and water repellant union of the base and casing at the point where the housing is mounted.

3,697,739

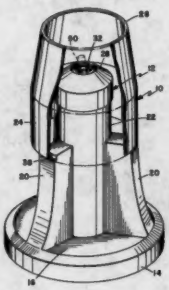
FUEL BURNING TABLE LAMP

David M. Novak, 17464 Ivy, Fontana, Calif., and Roberty E. Brown, P.O. Box 393, Elsinore, Calif.

Filed July 8, 1971, Ser. No. 160,689

Int. Cl. F21l *19/00*

U.S. Cl. 240—17 **3 Claims**



A fuel burning table lamp having an upright, central, cylindrical sleeve resembling a candle that is supported with radial legs on a heavy base. A fuel container for fuel burning lamp unit fits in the upper part of the cylindrical sleeve and is shielded by a reflector element positioned on the top of the legs to show the bottom portion of the cylindrical sleeve. The cylindrical sleeve resembles a candle even though the light is provided by a normal wick immersed in the fuel container. The base is weighted to make it difficult to turn over or to carry away. The fuel unit is easily replaceable.

3,697,740

AREA LIGHTING LUMINAIRE

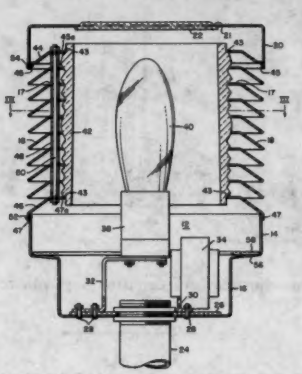
Charles P. Breed, Alexandria, Va., and Melvin R. Anderson, Avon Lake, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1969, Ser. No. 883,965

Int. Cl. F21v *11/02, 13/04*

U.S. Cl. 240—46.37 **1 Claim**

An area lighting luminaire which includes a base having a lamp socket and lamp mounted thereon and extending above the base. The lamp and lamp socket are surrounded by a light distributing housing which includes a cylindrical fresnel lens surrounded by a plurality of stacked annular louvers spaced one from the other and extending radially and downwardly to



shield the lens and lamp from view at viewing angles of horizontal and above. A cover member closes off the top of the light distributing housing and may include a central lens portion for the vertical release of light.

3,697,741

MECHANICAL HEADLAMP ADJUSTING MEANS

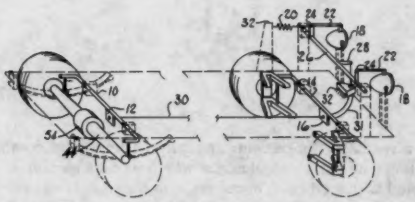
Gideon Petrus Schoeman Yssel, P. O. Noordburg, Potchefstroom, Transvaal, Republic of South Africa

Filed May 26, 1970, Ser. No. 40,605

Claims priority, application South Africa, May 29, 1969, 69/3851

Int. Cl. B60q *1/00*

U.S. Cl. 240—7.1 **10 Claims**



Mechanical arrangements for automatically raising or lowering of light beams emitted by vehicle headlamps responsive to uneven sag of the vehicle body at the front and at the rear, the arrangements providing flexible connections extending between parts associated with and movable relative to sprung and unsprung vehicle members and adapted to control the operation of a light beam adjusting mechanism in or against a direction of applied resilient biassing. The flexible connections being of a kind for leading along tortuous paths as may be required on different vehicles.

3,697,742

TRIM RING FOR ARCHITECTURAL LIGHT INCLUDING MEANS FOR STEPPED ROTATIONAL AND AXIAL ADJUSTMENT

Mitchell Bobrick, Beverly Hills, Calif., assignor to Air King Corporation

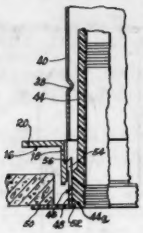
Filed Sept. 4, 1970, Ser. No. 69,547

Int. Cl. F21v *21/22*

U.S. Cl. 240—78 HA **5 Claims**

A recessed lighting fixture is provided in which the trim ring has a number of substantially vertical hanger members which

cooperate with stepped shoulders carried by the lower portion of the main cylindrical frame of the fixture to provide selective



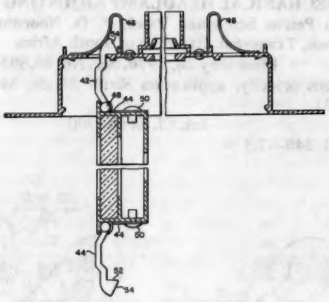
axial height adjustment of the trim ring with respect to the frame.

3,697,743

HINGE AND LATCH MECHANISM FOR FLUORESCENT LUMINAIRE

William R. Eargle, Vicksburg, Miss., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,614
Int. Cl. F21v *17/00*
U.S. Cl. 240—147 **9 Claims**



In a recessed fluorescent luminaire an improved combination hinge and latch mechanism which includes a plurality of inverted L-shaped latch members with raised curved cam portions on the upper ends thereof rotatably secured to the frame of the light-transmitting luminaire door or closure. The luminaire housing includes laterally extending flanges on the side walls adjacent the bottom or open end having apertures therethrough at locations complementary to the locations of the latch members on the door. Curved leaf springs overlie the apertures and are constructed and arranged to cooperate with the curved cam portion of the latch member to releasably retain the latch members in a latched position. When the latches on one side of the luminaire are released the latches on the opposite side serve as hinges through their rotatable connection to the door frame.

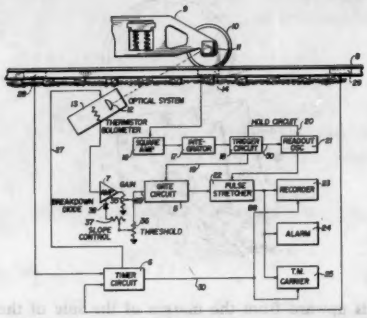
3,697,744

HOT BOX DETECTOR OPERABLE WITH DIVERSE TYPE BEARING ASSEMBLIES

Roland A. Howell, 3814 Woodbrook Drive, Chattanooga, Tenn.

Filed April 29, 1970, Ser. No. 32,909
Int. Cl. B61k *9/06*; B61l *3/06*
U.S. Cl. 246—169 D **7 Claims**

An electronic hot box detector provides for giving alarm signals in response to overheated bearings of moving railroad cars. Special electronic control circuits avoid either errors of omission of a reading when a bearing heated above a predetermined temperature is presented or false alarms from other heated bodies in the train. Nevertheless, the detector senses overheated bearings of different types that present diverse temperature ranges. Thus precisely controlled electronic gates



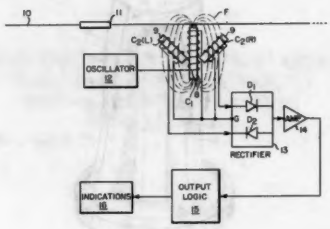
are used to sense thermal samples which are processed through amplifier circuits providing non-linear amplification characteristics to establish a readable range encompassing the desired thermal variations of both roller bearing and friction bearing assemblies.

3,697,745

FLUX NULLED WHEEL DETECTOR

Norman A. Bolton, Scottsville, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed May 18, 1970, Ser. No. 38,085
Int. Cl. B61l *13/04*
U.S. Cl. 246—249 **9 Claims**



An apparatus for detecting the presence of a ferro-magnetic vehicle wheel has been provided. A primary coil energized with an alternating current input signal produces a magnetic field in the vicinity of the rail on which the wheel is moving. A secondary coil responsive to the field is aligned in the primary field such that a null or zero signal exists at the output of the secondary in the absence of a vehicle wheel. The presence of a wheel in the primary field disturbs that field sufficiently to produce an output in the secondary coil, thus providing indication of wheel presence.

3,697,746

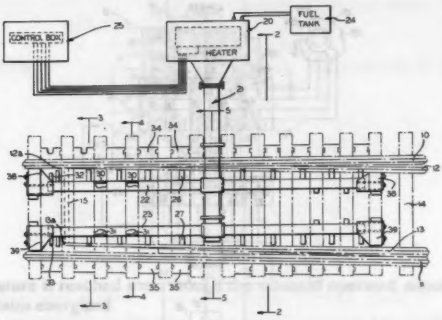
RAILROAD SWITCH HEATER

Gordon I. Patterson, Dollard Des Ormeaux, and Dugald J. Telfer, Chomedy, Quebec, both of Canada, assignors to Vapor Corporation, Chicago, Ill.

Filed May 26, 1971, Ser. No. 147,085
Int. Cl. E01b *7/24*
U.S. Cl. 246—428 **5 Claims**

A heater for a railroad track switch using forced hot air to heat the area between the moving and fixed rails to maintain the area free of ice and snow, and to heat the side plates and maintain them free of ice and snow, including duct work and

distribution outlets for distributing hot air evenly over the entire switch length in the areas where the elimination of snow



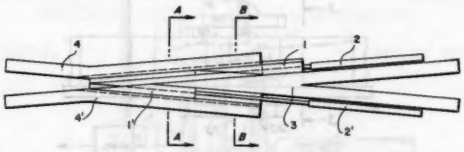
and ice will permit the movable rails to operate freely and easily.

3,697,747

FROG

Curt Edeling, Essen-Rellinghausen, and Joseph Eisenmann, Munich, both of Germany, assignors to Elektro-Thermit GmbH, Berlin, Germany

Filed June 29, 1970, Ser. No. 50,660
Claims priority, application Germany, July 2, 1969, P 19 33 451.1
Int. Cl. E01b 7/10
U.S. Cl. 246—468 5 Claims



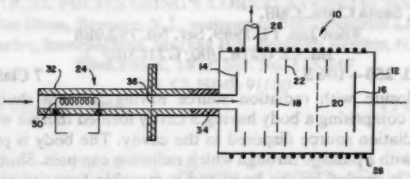
This invention relates to an improved frog including movable wedge means for closing the gap between the frog point and the wing rail.

3,697,748

PLASMA CHROMATOGRAPH WITH INTERNALLY HEATED INLET SYSTEM

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Continuation-in-part of Ser. No. 779,096, Nov. 26, 1968. This application Oct. 6, 1969, Ser. No. 864,046
Int. Cl. H01j 39/34; B01d 59/44
U.S. Cl. 250—41.9 TF 8 Claims



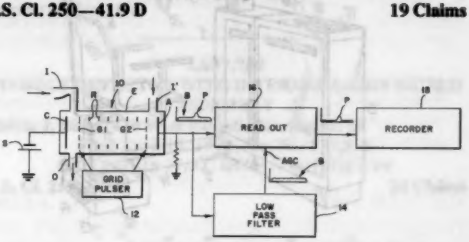
Response time of drift-cell apparatus for measuring trace gases is improved by heating the drift cell walls and/or the sample inlet to reduce the accumulation of sample substances. Heated filters and electrode structures with tortuous gas paths are also disclosed.

3,697,749

APPARATUS AND METHODS FOR ENHANCING THE DETECTION OF SMALL-SOURCE PLUMES FROM MOVING AIRCRAFT

Roger F. Wernlund, Lake Worth, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Sept. 30, 1970, Ser. No. 76,797
Int. Cl. H01j 39/34
U.S. Cl. 250—41.9 D 19 Claims



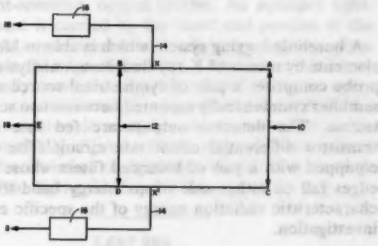
Detection of small-source plumes, as by an airborne instrument, wherein ions formed from the molecules of a gaseous sample and collected by the airborne instrument are segregated in a drift field, and signals produced in response to the detection of the segregated ions are separated into short-duration plume signal components and long-duration background components. The short-duration components are indicated with enhanced resolution.

3,697,750

METHOD FOR THE DETECTION OF CHANGE IN DENSITY OF A CARRIER GAS AND APPARATUS THEREFOR

Orville F. Folmer, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 1, 1971, Ser. No. 111,514
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 D 4 Claims



An improved method and apparatus for the detection of minute changes in density of a carrier gas. The improvement comprises the use of outlet tubes for tapping off of small samples of reference gas and measuring the change in flow rate of the reference gas through the outlet tubes.

3,697,751

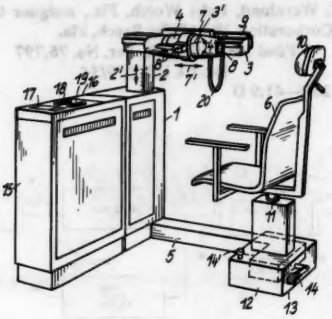
APPARATUS FOR RADIATION DIAGNOSIS

Edgar Tschunt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 21, 1969, Ser. No. 826,589
Claims priority, application Germany, May 29, 1968, P 17 64 389.9
Int. Cl. G01j 39/18; G01t 1/20
U.S. Cl. 250—50 9 Claims

An apparatus for radiation diagnosis having a radiation detector movably mounted on a support arm which is connected to a stand mounted in the housing of the apparatus. The ap-

paratus has an elongate support member secured to a lower end region of the housing below the support arm, which



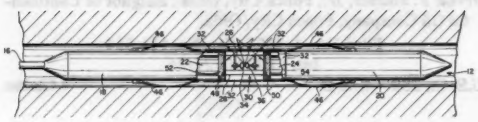
member is adapted to carry a chair for accommodating a patient.

3,697,752

PROBE FOR LOCATING SPECIFIC ELEMENTS IN A BOREHOLE

Ira Lon Morgan, and John R. Rhodes, both of Austin, Tex., assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed April 1, 1969, Ser. No. 811,995
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **6 Claims**



A borehole logging system which is able to identify specific elements by means of X-ray fluorescent analysis. The logging probe comprises a pair of symmetrical source and shield assemblies symmetrically mounted between two scintillation detectors. The detector outputs are fed into a field-effect transistor differential count rate circuit. The detectors are equipped with a pair of balanced filters whose K absorption edges fall on either side of an energy band that includes a characteristic radiation energy of the specific element under investigation.

3,697,753

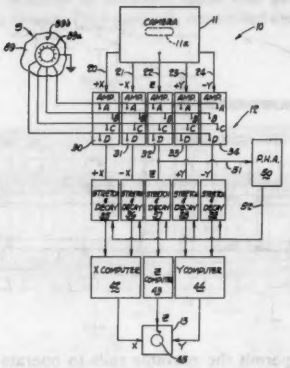
SCINTILLATION CAMERA HAVING A VARIABLE GAIN PLURAL AMPLIFIER SYSTEM

Ronald J. Martone, Cheshire, and Peter G. Mueller, Guilford, both of Conn., assignors to Picker Corporation, White Plains, N.Y.

Filed June 18, 1969, Ser. No. 834,346
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 S **11 Claims**

A scintillation camera system is disclosed having a scintillator camera which produces electrical signals corresponding to scintillation intensity and location on a scintillator. The system has circuitry for processing these signals including a plurality of signal amplifiers which individually amplify the intensity and location signals. The gain of these signal amplifiers is adjustable by a remote switch which alters the condition of gain control circuitry associated with the signal amplifiers.

The disclosed signal amplifiers further include a control circuit which stabilizes the direct current (D.C.) output of the amplifiers at a particular level with respect to a reference volt-



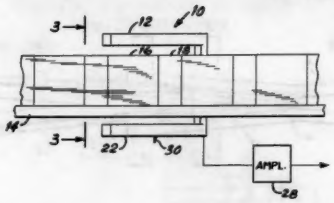
age and yet permits output pulses to be produced without altering the output pulse amplitudes.

3,697,754

CONTAINER FILL WEIGHT MONITORING SYSTEM

Milton Maxwell, Livingston, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed April 17, 1969, Ser. No. 817,067
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 **5 Claims**



An apparatus for monitoring the mass or weight of consecutive individual containers moving on a conveyor unit including radiation means spaced from a conveyor unit for subjecting filled containers to a field of nuclear radiation. Suitable detection means detect the amount of radiation not absorbed by the filled containers and correlate this with the fill weight which is then translated to an electrical signal and fed to suitable recording means.

3,697,755

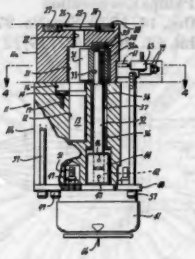
ENCLOSURE WITH RADIATION SOURCE HAVING FAIL SAFE SHUTTER

Mathew G. Boissevain, Los Altos Hills, and Robert C. Hill, Santa Clara, both of Calif., assignors to Measurex Corporation, Santa Clara, Calif.

Filed Jan. 17, 1969, Ser. No. 792,088
Int. Cl. G21h 5/00; G21f 5/02
U.S. Cl. 250—106 S **7 Claims**

Enclosure with radiation source having fail-safe shutter means comprising a body having a cavity formed therein with the radiation source disposed in the cavity. The body is provided with a passage through which radiation can pass. Shutter means is carried by the body and is movable between open and closed positions with respect to the passage. Means is provided for yieldably urging the shutter means towards a closed position and solenoid operated means is provided for moving the shutter means to an open position against the force of the yieldable means. Temperature responsive means independent

of the solenoid operated means is provided for moving the shutter means to a closed position when a predetermined temperature is reached even though the solenoid operated means remains energized.

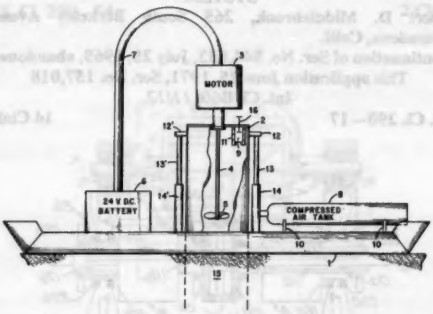


3,697,756

DEVICE FOR INSERTING TAGGED SAND INTO OCEAN FLOOR

Elick H. Acree, Lenoir City; Hugh R. Brashear, Jr., Concord, and Forrest N. Case, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed July 7, 1971, Ser. No. 160,390
Int. Cl. G21h *5/02*
U.S. Cl. 250—106 T **4 Claims**



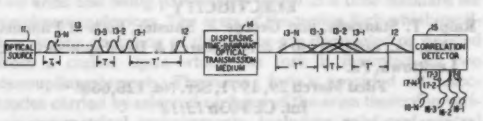
A device is provided for introducing an identifiable radioisotope tag into the ocean bottom in such a manner that a radiation material balance can be observed as the sand transport process occurs. The device comprises a cylinder having a motor-operated stirrer for admixing sand and a quantity of isotope tagged sand, the cylinder being mounted on a sled in such a manner that it can be depressed vertically by means of a hydraulic ram into the ocean bottom.

3,697,757

ARRANGEMENTS FOR DETECTING DISTORTED OPTICAL PULSES USING A CORRELATION TECHNIQUE

Julian Stone, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 8, 1971, Ser. No. 113,547
Int. Cl. H04b *9/100*
U.S. Cl. 250—199 **11 Claims**



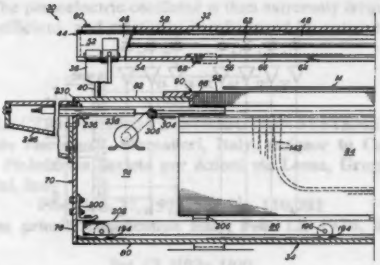
This application describes various arrangements for resolving a train of overlapping optical pulses. In each, a pilot pulse is used in conjunction with an information pulse train, to form a spatial pattern of cross-correlation functions of the information pulses. By selecting the time delay between adjacent pulses to be greater than the reciprocal of the pulse bandwidth, the correlation functions forming the aforesaid pattern are spatially resolvable. Thus, detection of each of the pulses of the train is realized by recording the peak of its corresponding correlation function.

3,697,758

PINHOLE DETECTOR WITH INTERNAL LIGHT SHIELD ASSEMBLY

Melvin J. Binks, 410 West Russell, Barrington, Ill.

Filed April 13, 1971, Ser. No. 133,511
Int. Cl. G01n *21/32*; G05b *1/00*; H01j *3/14*
U.S. Cl. 250—202 **24 Claims**



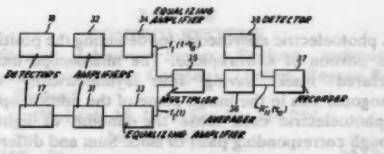
A light source is directed toward an elongated aperture in a scanner housing. A light-sensitive optical system within the housing generates a signal in response to light passing through a hole in a strip moving across the aperture. A light guide in the aperture consists of a louver-like array of light transmitting elements or channels. The light guide transmits only light received in a direction parallel to a plane which is substantially vertical and substantially parallel to the line of movement of the strip. A concealed, elongated edge light shield is supported within the housing, between the light guide and the pinhole-detecting, light-sensitive, optical system. An auxiliary light-sensitive element is carried by the inner end portion of the edge light shield in position to receive light passing through to the light guide at the edge of the strip. A drive motor and control automatically move the edge light shield along the aperture inside the scanner housing in response to a signal from the auxiliary light-sensitive element; this maintains the light-sensitive element vertically aligned with the edge of the strip, and prevents the transmission of light into the housing through that portion of the light guide beyond the edge of the strip.

3,697,759

METHOD OF TESTING A STRIP MATERIAL AND APPARATUS THEREFOR UTILIZING AUTOCORRELATION

Etienne Marie De Cock, Hamme, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed July 28, 1971, Ser. No. 166,661
Int. Cl. H01j *39/12*; G01n *21/32*
U.S. Cl. 250—209 **4 Claims**



A method of testing a moving strip of material, wherein the density of the strip is measured at two successive places, the

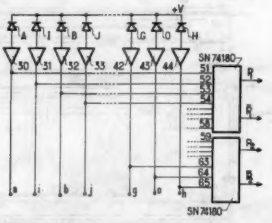
instant measurement signal obtained at the first place is multiplied by a factor which is proportional to the instant value of the measurement signal at the second place, and the average value of the resultant product signal is determined.

3,697,760

OPTICAL-ELECTRICAL MOVEMENT DETECTOR UTILIZING STAGGERED ROWS OF PHOTODETECTORS AND LOGIC FOR DETERMINING THE LOCATION OF A LUMINOUS SPOT

Jean-Pierre Biet, Saulx-Les-Chartreux; Quang Tan Nguyen, Fontenay-Aux-Roses; Gerard Peres, Roussigny-Limours, and Gerard Ripoche, Massy, all of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Aug. 17, 1971, Ser. No. 172,532
Int. Cl. H01j 39/12
U.S. Cl. 250—209 5 Claims



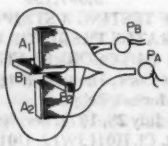
An optical-electrical detecting device comprising a series of staggered photo-sensitive diodes are appropriately connected to electronic circuits for providing a signal corresponding to the position of a relatively small luminous spot. The photodiodes are arranged in two rows and are separated by baffle reflectors for providing a signal through logic gates to an integrated parity control circuit for defining the position of the luminous spot.

3,697,761

METHOD AND MICROSCOPE FOR DETECTING THE POSITION OF A WORKPIECE

Shin-ichi Kamachi, Tokyo, Japan, assignor to Olympus Optical Co. Ltd.

Continuation-in-part of Ser. No. 16,689, March 5, 1970. This application March 18, 1971, Ser. No. 125,800
Int. Cl. H01j 39/12
U.S. Cl. 250—222 R 5 Claims



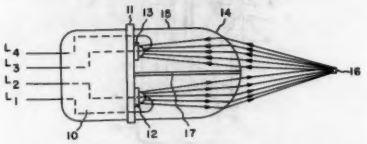
A photoelectric microscope for detecting the position of the edge portion of a workpiece. The microscope includes an apertured mask having four symmetrically disposed, orthogonal slits in the image plane of the microscope. A pair of photoelectric cells sense the amount of light passing through corresponding pairs of slots. Sum and difference amplifiers connect the outputs of the photoelectric cells to logic circuitry so that the position, orientation and direction of workpiece travel may be uniquely determined.

3,697,762

PHOTO ELECTRIC SWITCHING DEVICE

Stewart Kendall Kurtz, Yorktown Heights, N.Y., assignor to North American Philips Corporation

Filed Dec. 14, 1970, Ser. No. 97,549
Int. Cl. H01j 5/02, 39/12
U.S. Cl. 250—239 8 Claims



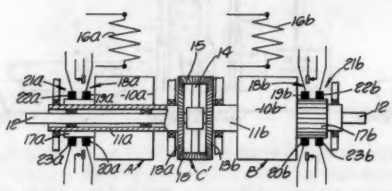
A photo electric switching device having a light emitting diode and light-sensing element arranged in side-by-side relation. A light reflecting element is arranged so that when it is passed into the path of radiant energy eminating from the light emitting diode, a large portion of the light beam will be reflected to the light-sensing element so as to initiate an "on" or an "off" function. A lens element may be arranged in the path of the light beam so as to increase the degree of resolution and the elements can be arranged on a flatpack with other electronic circuitry in a convenient switching unit.

3,697,763

ADJUSTABLE SPEED ELECTRIC POWER MEANS AND SYSTEM

Robert D. Middlebrook, 265 South Berkeley Avenue, Pasadena, Calif.

Continuation of Ser. No. 844,853, July 25, 1969, abandoned. This application June 25, 1971, Ser. No. 157,018
Int. Cl. B60l 11/12
U.S. Cl. 290—17 14 Claims



Electrical power means and system in which at least two D.C. dynamo-electric machines are electrically connected and mechanically drivingly connected through differential gearing with a common output shaft to provide an electro-mechanical loop configuration. Each of the machines has one or more sets of commutator brushes, and at least one of the machines is provided with a movable set of commutator brushes which are electrically connected with brushes of the other machine. Relative angular adjustment of the brush sets of the machines produces smooth concomitant changes in the speed of the output shaft in one direction from zero to a maximum. The continuously connected electrical connections between the machines enable automatic dynamic braking and regeneration without the necessity of switching operations.

3,697,764

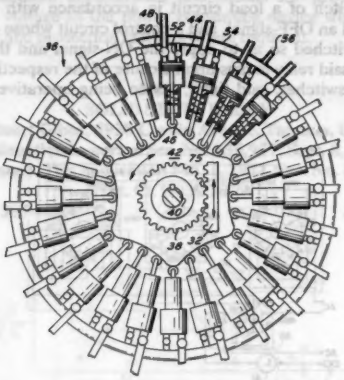
METHOD AND APPARATUS FOR GENERATING ELECTRICITY

Ralph T. Stanziola, and George A. Shuster, both of Philadelphia, Pa., assignors to S & S Research & Development Corp., Levittown, Pa.

Filed March 29, 1971, Ser. No. 128,668
Int. Cl. F03b 13/12
U.S. Cl. 290—42 16 Claims

Motion of waves is converted into energy in the form of compressed air which is stored in large containers. Com-

pressed air flowing from the containers is utilized to drive turbine-generators to generate electricity. The turbine-generators are selectively driven by stored energy which may be controlled. Generation of electricity may be varied to meet the demand regardless of the tides or the state of the waves.



3,697,765

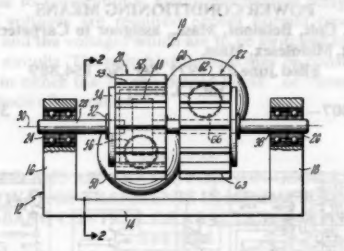
FLUID DRIVEN ELECTRICAL POWER APPARATUS

Eugene P. Carini, 800 28th Avenue, Vero Beach, Fla.

Filed Dec. 7, 1970, Ser. No. 95,462

Int. Cl. F03d 9/00

U.S. Cl. 290—54 **2 Claims**



A fluid driven electrical power producing apparatus in which a field assembly is rotated in one direction by first fluid drive device and the armature assembly is driven in the opposite direction by a second fluid drive device.

3,697,766

PIEZOELECTRIC OSCILLATOR IN THE FORM OF A TUNING FORK

Wolfgang Ganter, Schramberg-Sulgen; Friedrich Assmus, Schramberg, and Manfred Sonntag, Schramberg-Sulgen, all of Germany, assignors to Gebrueder Junghans G.m.b.H., Schramberg/Wuerttemberg, Germany

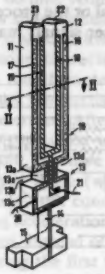
Filed Feb. 12, 1971, Ser. No. 114,880

Claims priority, application Germany, Feb. 27, 1970, P 20 09 379.2

Int. Cl. H01v 7/00

U.S. Cl. 310—8.2 **3 Claims**

A piezoelectric oscillator in the form of a tuning fork having two arms and being particularly useful as a time standard for timekeeping devices. The arms of the tuning fork which oscillate during operation of the device are decoupled or isolated from a carrier upon which the fork is mounted by two decoupling elements. The tuning fork is provided with electrodes carried by selected surfaces of the arms thereof in various symmetrical arrangements, including axial and central symmetry. One of the decoupling elements is disposed intermediate the arms of the tuning fork and the position at which the electrical connections are made to the electrodes so that the mass of the electrodes does not affect the oscillation of the arms. The piezoelectric oscillator is thus extremely frequency stable, efficient, and relatively uninfluenced by external factors.



3,697,767

ELECTRIC ENERGY DISTRIBUTION SYSTEMS

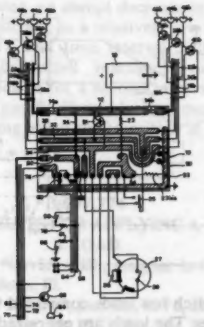
Leonardo Floravanti, Moncalieri, Italy, assignor to Carrozzeria Pininfarina Societa per Azioni via Lesna, Grugliasco (Turin), Italy

Filed Jan. 27, 1971, Ser. No. 110,201

Claims priority, application Italy, Feb. 12, 1970, 67459 A/70

Int. Cl. H02g 3/00

U.S. Cl. 307—10 R **9 Claims**



An power distribution system for distributing electrical power; from a source of supply to selected loads. The distribution system includes a composite cable having a power lead and a plurality of control leads with electrically operated switches associated with each load whereby an appropriate signal on a control lead triggers the switch which then connects the appropriate load to the power lead. The composite cable has a thin plastics sheath which can be pierced by the electrical pin-shaped terminals of the transistors forming the switches, and the invention also provides a template which unambiguously locates the transistors.

3,697,768

CONTROL SYSTEMS

James Stewart Johnston, Sussex, England, assignor to Rosemount Engineering Company, Limited, Bognor Regis, Sussex, England

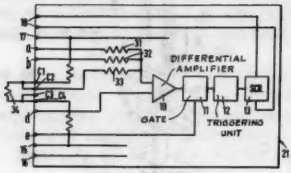
Filed Feb. 10, 1971, Ser. No. 114,294

Int. Cl. H02j 1/00

U.S. Cl. 307—31 **20 Claims**

A multi-point control system suitable for applications where a large number of processes, typically in excess of 100, are all

required to be stabilized at the same operating conditions. The control system comprises on-off controllers fed with a common set-point signal. The controllers being adapted to function as time-proportional controllers by the perturbation of either the set-point signal or the process parameter signal by a periodic waveform. Other signals may be combined with the



perturbing signal to provide, for example, compensation for a fluctuating power supply, or for environmental conditions affecting the deviations at the inputs of controllers. Such a system has economical advantages and by slight modifications to the controllers, the system can be used for differing applications.

3,697,769

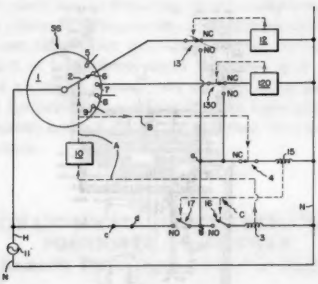
STEPPING SWITCH SYSTEM

Michael Lawrence Schneier, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed July 26, 1971, Ser. No. 165,503

Int. Cl. H01h *63/16*

U.S. Cl. 307—41 **7 Claims**



A stepping switch has loads connected to its fixed contacts via limit switches. The loads are energized sequentially as the movable contact of the stepping switch is stepped from fixed contact to fixed contact, dwelling on each fixed contact until the corresponding limit switch is actuated to produce an electrical pulse. Such pulse energizes a stretcher relay coil which both establishes a circuit which independently of the limit switches and the stepping switch contacts, keeps it energized and energizes the step coil of the stepping switch. The stretcher relay coil is energized through a normally-closed snap switch which opens temporarily at the end of a step, and de-energizes the stretcher relay coil which, in turn opens the aforesaid circuit, whereby to de-energize both the step coil and itself.

3,697,770

RECORDING CLOCK AND ELECTRICAL SYSTEM

Kingo Murata, and Katsutoshi Shinohara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Koparu, Tokyo, Japan

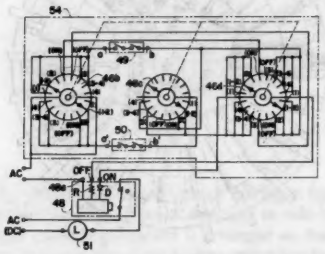
Filed March 31, 1971, Ser. No. 129,698

Claims priority, application Japan, April 20, 1970, 45/37549

Int. Cl. H01h *7/08, 43/10, 33/59*

U.S. Cl. 307—141.4 **4 Claims**

A multiplex action timer device interlocked with a clock mechanism comprising two pairs of time-setting mechanism arranged so that two pairs of micro-switches are closed at the pre-set time, relay means for controlling make and break of a power switch of a load circuit in accordance with an ON-signal and an OFF-signal, and a control circuit whose connection is switched so as to apply the ON-signal and the OFF-signal to said relay means upon closure of the respective pairs of micro-switches, said timer device being operative so that



the power switch of the load circuit is actuated in such a way that its connection is changed — in accordance with the pre-set time — to assume one of the following modes of switching action, namely, from ON to OFF; from OFF to ON; from OFF to ON and then to OFF again and thereafter repeating this cycle; and from ON to OFF and then to ON again and thereafter repeating this cycle.

3,697,771

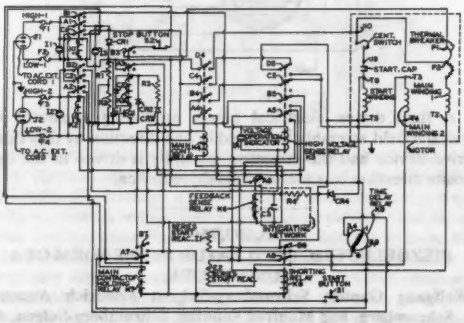
CARPET CLEANING APPARATUS WITH ELECTRICAL POWER CONDITIONING MEANS

James G. Colt, Belmont, Mass., assignor to Carpetech Corp., Everett, Middlesex, Mass.

Filed June 21, 1971, Ser. No. 154,889

Int. Cl. H02j

U.S. Cl. 307—154 **39 Claims**



There is disclosed apparatus for cleaning carpets, upholstery and the like utilizing a motor driven separate reservoir system for supplying a cleaning solution to a cleaning head, a separate motor driven vacuum pick-up system for storing cleaning solution picked up via the cleaning head, and a power control system for safely and dependably supplying from two separately fused convenience electrical outlets, electrical current to the power consuming devices including the drive motors of the apparatus, one of which devices may have power demand characteristics in excess of that suppliable from one or both outlets. Typically, the reservoir system may include means to continuously heat the cleaning solution in the reservoir and a fluid pump driven by an electric drive motor and the vacuum system may include a vacuum pump which is driven by a second electric drive motor. The power control system which is not limited to use with carpet cleaning apparatus comprises means to provide a predetermined orienta-

tion of the connections to the convenience outlets, means to determine the level of voltage produced by the combination of the orientated connections, and means for providing the desired voltage to the power consuming device with current limiting and protection features where required.

3,697,772

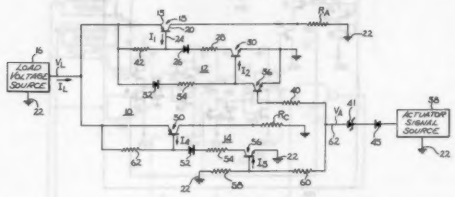
SOLID STATE RELAY

Ralph Stuart Gibbs, 5938 Corbin Avenue, Tarzana, Calif.

Continuation-in-part of Ser. No. 855,957, Sept. 8, 1969, abandoned. This application Feb. 1, 1971, Ser. No. 111,284

Int. Cl. H03k 17/64

U.S. Cl. 307—244 **25 Claims**



Solid state switching devices for selectively switching current signals between various load circuits. Normally open and normally closed transistorized switching sections incorporate non-inductive driver stages adapted for high speed operation with excellent isolation between the load circuits and the control or driver circuits. The switching sections are readily combinable to form configurations which are functionally analogous to conventional electromechanical relays and no external voltages are required except normal type control voltages and the voltages which are to be switched to the various load circuits. The switching devices may be constructed to operate in either the "make before break" or "break before make" mode of operation.

3,697,773

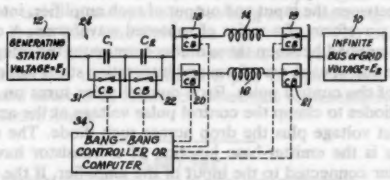
METHOD AND APPARATUS FOR NON-OSCILLATORY REMOVAL OF TRANSIENTS IN MINIMUM TIME BY BANG-BANG CONTROL OF REACTANCE IN A POWER SYSTEM

Daniel K. Reitan, Madison, Wis., and Ramarao Nagavarapu, Warangal, India, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 848,463, Aug. 8, 1969, abandoned. This application Jan. 11, 1971, Ser. No. 105,353The portion of the term of this patent subsequent to Feb. 9, 1987, has been disclaimed.

Int. Cl. H02h 1/04

U.S. Cl. 307—93 **32 Claims**



In a power transmission system involving parallel tie-lines extending between a generating station and a large power grid, transients are removed, upon the opening of one tie-line, by inserting two capacitors in series with the system for a first time interval. The capacitors produce a first capacitive reactance of a sufficiently high value to provide a negative power transmission characteristic so that there is a reverse flow of power between the grid and the generating station. In this way the inertia of the generators at the generating station is accelerated toward an increased power angle in accordance with the decreased power transmission characteristic due to the opening of the one tie-line. After the first time interval, one of the capacitors is short-circuited so as to reduce the capacitive reactance to a second lower value. In this way a positive power transmission characteristic is produced of a greater magnitude than the characteristic in the absence of capacitive reactance. Thus, the inertia of the generators at the generating station is decelerated. After a second time interval, both capacitors are short-circuited to remove all capacitive reactance from the circuit. The time intervals are such as to attain the increased power angle (which is the steady state operating angle under post-fault conditions) which equalizes the energies representing acceleration and deceleration so as to obviate any oscillations. Instead of using the high value of capacitive reactance during the first time interval, an inductive reactance may be employed, which provides a reduced power transmission characteristic so that acceleration of the generating station is produced. The invention is also applicable to other transitions in which it is desirable to prevent oscillation of the power angle of the generating system. When the second tie-line is brought back into service, the power angle may be reduced without oscillation, by switching in a relatively low value of capacitive reactance for a first time interval, so as to increase the power transmission characteristic. During a second time interval, the power transmission characteristic is reduced or reversed by switching in an inductive reactance or a high value of capacitive reactance. If the electrical load on the generating station increases abruptly, the power angle can be increased the necessary amount without oscillation by switching in a high value of capacitive reactance, or an inductive reactance, for a first time interval, following which a lower value of capacitive reactance is switched in for a second time interval. Likewise, an abrupt decrease in load can be accommodated by switching in a relatively low value of capacitive reactance for a first time interval, following which a higher value of capacitive reactance, or an inductive reactance, is switched in for a second interval. In each case, maximum acceleration is followed by maximum deceleration, or vice versa, to bring about the transition in minimum time, without oscillation.

3,697,774

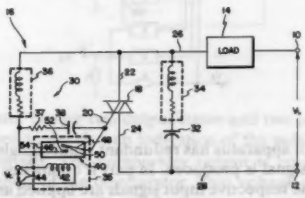
THYRISTOR CIRCUITS FOR APPLYING A VOLTAGE TO A LOAD

Joseph E. Pascente, Norridge, Ill., assignor to Grigsby-Barton, Inc., Rolling Meadows, Ill.

Division of Ser. No. 108,269, Jan. 21, 1971, abandoned. This application Aug. 20, 1971, Ser. No. 173,571

Int. Cl. H01h 9/30

U.S. Cl. 307—136 **21 Claims**

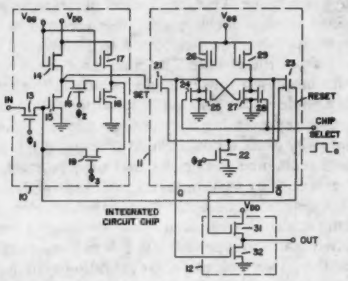


Thyristor circuits are disclosed for applying a voltage to a load wherein substantial improvements are provided with respect to increasing the operating life of switch contacts employed therein. A reduction in the amount of radio frequency interference generated in such circuits upon circuit switching may also be obtained. Such improvements are provided by the appropriate use of one or more inductors in the circuits, which may be employed together with certain other circuit components.

3,697,775
THREE STATE OUTPUT LOGIC CIRCUIT WITH BISTABLE INPUTS

James F. Kane, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed April 21, 1971, Ser. No. 136,031
Int. Cl. H03k *19/08, 17/18*
U.S. Cl. 307—209 6 Claims

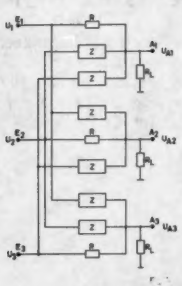


A three output state logic circuit includes the last cell of a shift register, which is a flip-flop, coupled to an RS type flip-flop which drives a push-pull output circuit. The output circuit is placed in a high impedance or floating logic state by grounding the output terminals of the RS flip-flop. The effect of this grounding is, however, isolated from the last cell of the shift register so that it maintains its stored binary information.

3,697,776
PLURAL CHANNEL SYSTEM WHEREIN THE INPUT SIGNALS ARE UNALTERED IF WITHIN STANDARD LIMITS, BUT ARE AVERAGED, IF OUTSIDE LIMITS

Edgar Matejka, Singen/Hohentwiel, Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen/Bodensee, Germany

Filed Dec. 15, 1970, Ser. No. 98,364
Claims priority, application Germany, Dec. 17, 1969, P 19 63 130.2; Nov. 10, 1970, P 20 55 084.9
Int. Cl. G06f *11/08;* G08b *29/00;* H03k *5/08*
U.S. Cl. 307—219 11 Claims

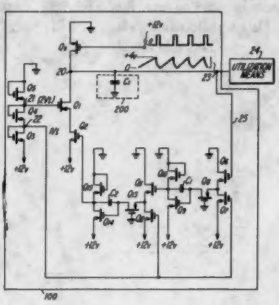


A control apparatus has redundant input signals from which an output signal is produced. In part it comprises three inputs to which the respective input signals are applied and three outputs. There are three resistors of known value with each connecting a respective input and a respective output. There are six resistance devices each connecting a respective input with one of the remaining outputs between which there is not one of the resistors. The resistance devices comprise a voltage sensitive double-pole whose resistance substantially equals said known value below a selected threshold voltage but which becomes very great above said threshold voltage. The threshold voltage is selected to be sufficiently greater than the normal input voltage to represent a malfunction situation.

3,697,777
SIGNAL GENERATING CIRCUIT INCLUDING A PAIR OF CASCADE CONNECTED FIELD EFFECT TRANSISTORS

William James Donoghue, Somerset, N.J., assignor to RCA Corporation

Filed May 17, 1971, Ser. No. 143,859
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 6 Claims

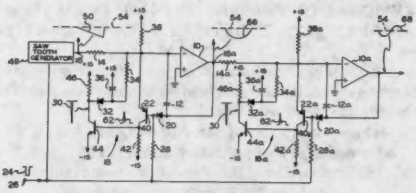


A signal generating circuit including a constant current source comprising cascoded field effect transistors. The first transistor is biased into saturation and the second transistor is biased in the linear resistive region of operation. Degenerative feedback is provided between the output of the first transistor and the control electrode of the second transistor. When an energy storage device and a switch are added, the circuit provides a constant amplitude ramp waveform.

3,697,778
INTEGRATING CIRCUIT

Ronald A. Olson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed March 17, 1971, Ser. No. 125,183
Int. Cl. G06g *7/18*
U.S. Cl. 307—229 7 Claims



An operational amplifier integrating circuit, which has a substantially constant voltage at the input of its amplifier and a pair of normally cut off diodes connected back to back in series between the input and output of such amplifier, integrates each waveform of a series of repeated waveforms. A control pulse applied between these diodes terminates the integration at the end of each waveform and integration starts again at the end of the control pulse. Each control pulse turns on one of the diodes to clamp the control pulse voltage at the amplifier output voltage plus the drop across such diode. The second diode is the emitter-base junction of a transistor having its emitter connected to the input of the amplifier. If the output voltage of the amplifier has a polarity with respect to the amplifier input voltage which is the same as that of the control pulse, the second diode also turns on and the integrating capacitor rapidly discharges through the emitter-base junction of the transistor to produce an output pulse at the collector of the transistor which varies with the difference between the input and output voltages of the amplifier at the end of the integration. A further circuit utilizes this pulse to deliver to the

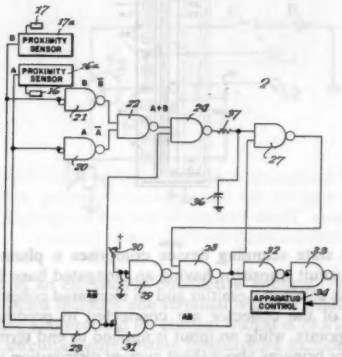
input of the amplifier during the next integration a substantially constant current which causes the output voltage of the amplifier at the end of such integration to be the same as its input voltage.

3,697,779

FUNCTION CONTROL

Gordon E. Gee, Homewood, Ill., assignor to Electro Corporation

Filed July 18, 1969, Ser. No. 842,847
Int. Cl. H03k *19/32*
U.S. Cl. 307—235 **7 Claims**



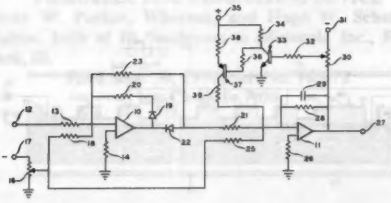
A control circuit which responds to plural characteristics of an apparatus. When synchronism of the characteristics is lost for a period of time, a signal is given to turn the apparatus off.

3,697,780

LIMIT CONTROL

Richard W. Michael, and Hi W. Staten, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed April 12, 1971, Ser. No. 133,030
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **8 Claims**



A circuit is disclosed which provides an output signal which is representative of an input signal as long as the input signal is above a lower limit and below an upper limit. The output signal does not fall below the lower limit nor rise above the upper limit. This circuit includes a pair of operational amplifiers and sources of reference potentials representative of the respective limits.

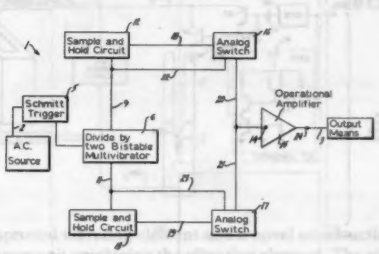
3,697,781

FREQUENCY TO VOLTAGE CONVERTER

Michael B. McLean, Franksville, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 12, 1970, Ser. No. 88,849
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **8 Claims**

A sample-and-hold circuit samples an incoming alternating signal to provide a voltage proportional to input frequency of a sinusoidal signal. A Schmitt trigger circuit and a divide-by-two multivibrator convert the sinusoidal input signal into two square wave signals separated in phase by 180° and each corresponding to the previous full cycle of the input to provide sampling signals to a pair of sample-and-hold circuits. Each sample-and-hold circuit samples the opposite half cycle or period of a corresponding square wave. Transistor means are connected to the corresponding timing circuit to discharge a



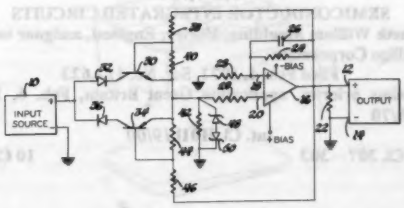
voltage storage means prior to sampling in response to the start of the sampling half period. Each sample-and-hold circuit includes a transistor selectively charging the voltage storage means from a constant voltage source during the sampling half period to produce a voltage level related to the input frequency which voltage level is held during the non-sampling half period. Analog switches are connected to the circuits and alternately connect each circuit to an output amplifier to apply the hold voltage during the non-sampling half period.

3,697,782

TWO-STATE ZERO-CROSSING DETECTOR

Michael F. Matouka, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1971, Ser. No. 182,003
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **3 Claims**



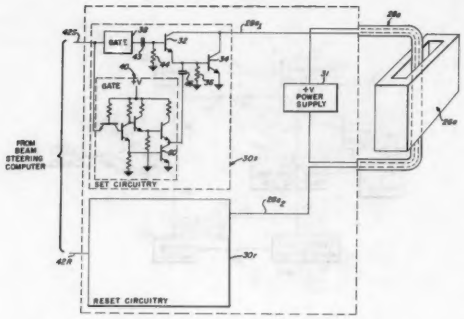
A comparator having two output states and two input connections is used to develop an indication of the polarity of an alternating voltage. The comparator output is coupled with one of two inputs of the comparator. Two voltage controlled switches including opposite conductivity type transistors and oppositely poled diodes are connected such that the voltage being sensed is applied to the second input to the comparator when it changes polarity, thereby changing the state of the comparator output. Control of the switches in accordance with the comparator output and the sensed voltage provides a disconnect feature whereby the detector draws power from the sensed voltage only during switching intervals; no power is drawn after a change in polarity by the sensed voltage until it again reverses its polarity.

3,697,783

TRANSISTOR SWITCHING CIRCUITRY

Ronald W. Seager, Hamilton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed April 29, 1971, Ser. No. 138,551
Int. Cl. H03k 17/60
U.S. Cl. 307—300 4 Claims



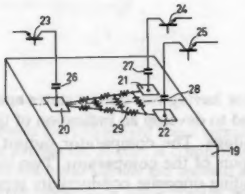
Transistor switching circuitry, such circuitry including an input transistor and an output transistor coupled one to the other in a "Darlington" configuration is shown. The input transistor is coupled to a control signal source through a first gating arrangement and the output transistor is coupled to the control signal source through a second gating arrangement and a voltage storage element. The output transistor is driven "on" in response to a turning "on" signal from both the input transistor and the second gating arrangement. During the time the output transistor is "on," a voltage is stored by the voltage storage element, the level of such stored voltage approaching the voltage level of a voltage supply. When an "off" control signal is transmitted, the voltage storage element is coupled between the base-emitter electrodes of the output transistor, thereby rapidly to deplete the number of minority carriers in the output transistor and render it more quickly responsive to the "off" control signal.

3,697,784

SEMICONDUCTOR INTEGRATED CIRCUITS

Kenneth William Moulding, Horley, England, assignor to U.S. Philips Corporation

Filed Feb. 4, 1971, Ser. No. 112,623
Claims priority, application Great Britain, Feb. 6, 1970, 5,808/70
Int. Cl. H01l 19/00
U.S. Cl. 307—303 10 Claims



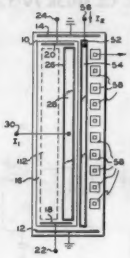
An integrated circuit eliminates the feedback effect of spurious signals between a push-pull transistor pair in separate islands and a third transistor in a third island by locating the third transistor island at a null point of the electric field pattern in the substrate corresponding to a spurious signal originating from the push-pull transistors.

3,697,785

SOLID STATE SCANNING DEVICE

Barrie Gilbert, Portland, Oreg., assignor to Tektronix, Inc., Park Beaverton, Oreg.

Continuation of Ser. No. 737,237, June 14, 1968, abandoned, Continuation of Ser. No. 700,885, Jan. 26, 1968, Pat. No. 3,524,998. This application Feb. 8, 1971, Ser. No. 113,632
Int. Cl. H01l 19/04
U.S. Cl. 307—303 19 Claims



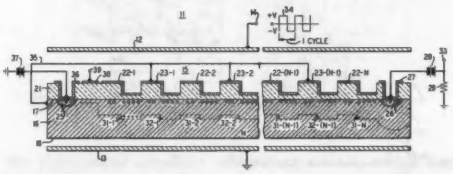
A solid state scanning device comprises a planar or integrated circuit transistor having an elongated base disposed between an elongated emitter and an elongated collector. End terminals of the collector are connected to predetermined potential points, while an input is applied to end terminals of the base for bringing about sheet current distribution injection into the collector. As a result, a parabolic voltage distribution is produced along the collector. The current injection profile can be "tilted" by applying a finite difference in voltage to the base end terminals which will cause controlled movement of the collector voltage distribution for selection of plural output means or the like.

3,697,786

CAPACITIVELY DRIVEN CHARGE TRANSFER DEVICES

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 29, 1971, Ser. No. 128,999
Int. Cl. H01l 11/14
U.S. Cl. 307—304 12 Claims



This application describes arrangements for capacitively driving a charge transfer device. In particular, a charge transfer device is disposed between the plates of a capacitor and is adapted such that the desired unidirectionality of transfer of charge therethrough is achieved in response to application of an alternating potential to the capacitor.

3,697,787

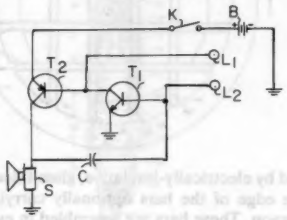
SUPERSENSITIVE ENERGIZING CIRCUIT

Seymour J. Posner, Brooklyn, N.Y., assignor to Friedman and Goodman, Brooklyn, N.Y., a part interest

Filed April 16, 1971, Ser. No. 134,637
Int. Cl. H03k 17/00
U.S. Cl. 307—308 13 Claims

A supersensitive energizing circuit comprising an impulse-generator for generating an impulse sensible by a responsive

sensory organ of a human being. An open-circuit arrangement is electrically coupled with the impulse-generator for permitting communicaTing the latter with an external power supply. A circuit-closure system is provided for closing the open-circuit arrangement thereby communicating the impulse-generator with the external power supply. The circuit-closure system is stationary and responsive for closing the open-circuit arrangement upon contact with skin of a human being. The supersensitive energizing circuit is generally



mounted in an electrically conductive housing. The circuit-closure system includes one terminal which is insulated from the housing and exposed for contact with skin of a human being. The circuit-closure system furthermore includes another terminal which is electrically coupled with the housing and thus when the housing is held in a hand of a human being the housing itself and the terminal which is insulated from the housing acts to close the open-circuit arrangement thereby supplying the impulse-generator with power.

ERRATUM

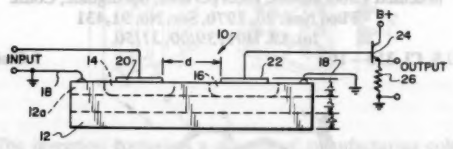
For Class 310—8; see:
Patent No. 3,697,766

3,697,788

PIEZOELECTRIC RESONATING DEVICE

Norman W. Parker, Wheaton, and Hugo W. Schafft, Des Plaines, both of Ill., assignors to Motorola Inc., Franklin Park, Ill.

Filed Sept. 30, 1970, Ser. No. 76,872
Int. Cl. H01v 7/00
U.S. Cl. 310—9.5 **17 Claims**



A piezoelectric resonating device forming a bandpass filter element which has a wider bandpass frequency than conventional crystal filters. A body of material has a plurality of principal areas of resonance formed therein to form at least one cooperable pair of such areas and the signal coupling between the principal areas of resonance of a given pair is selected so that all unwanted frequencies, including inharmonic and harmonic overtones, outside a given bandwidth are rejected.

3,697,789

MECHANICAL OSCILLATOR

Yoshiaki Kato, Higashimurayama, and Hideki Ohuye, Urawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 21, 1971, Ser. No. 155,195
Claims priority, application Japan, Sept. 9, 1970, 45/79093; June 23, 1970, 45/61921
Int. Cl. H01v 7/00
U.S. Cl. 310—9.5 **10 Claims**

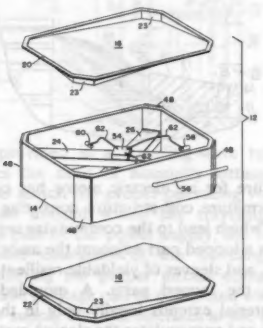
An improved vibrating element and a novel construction of an oscillator unit employing the vibrating element. The vibrating element is formed into a shape such that its vibrating part is divided into at least two prings with a slit therebetween. The width of the slit is uniform along the greater extent of said vibrating part from the open end thereof and is then gradually reduced substantially at a constant rate towards its closed end to thereby improve the shock resisting property of the vibrating element.

3,697,790

TRANSDUCERS HAVING PIEZOELECTRIC STRUTS

William T. Flint, and George C. Tibbetts, both of Tibbetts Industries, Inc., Colcord Avenue, Camden, Maine

Filed Dec. 2, 1970, Ser. No. 94,232
Int. Cl. H04r 17/00
U.S. Cl. 310—8.3 **33 Claims**



A transducer of electromechanical or electroacoustic type comprising a piezoelectric strut supported by a frame on a diagonal thereof. The frame is subjected to face shear stress by deflections of a generally saddle shaped diaphragm termed a "diabow," inducing longitudinal stresses in the piezoelectric strut. The strut has electrodes for connection with an electrical circuit.

3,697,791

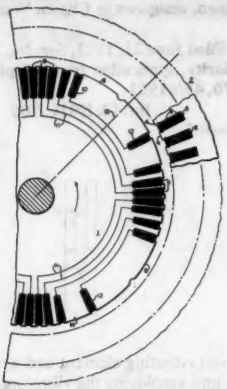
ROTOR FOR DYNAMOELECTRIC MACHINES

Lee A. Kilgore, Export, and Nabeel A. Demerdash, East Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1971, Ser. No. 173,005
Int. Cl. H02k 39/00
U.S. Cl. 310—111 **3 Claims**

A rotor, especially for large turbine generators, which is adapted to reduce excess stator copper losses due to radial

fluxes cutting the stator conductor strands. The rotor is of asymmetrical construction with a wide tooth on the trailing



side of each pole face to reduce saturation effects in the stator teeth and thus minimize the radial flux and resulting copper losses in the stator.

3,697,792

ELECTRIC MOTOR ARMATURE WITH STRESS RELIEVED, RESILIENT COMMUTATOR LEAD CONNECTIONS

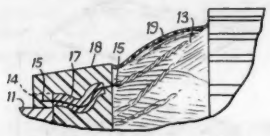
Albert Norman Roue, Bedford, England, assignor to Kango Electric Hammers Limited, London, England

Filed Jan. 25, 1971, Ser. No. 109,504

Claims priority, application Great Britain, Feb. 2, 1970, 4,956/70

Int. Cl. H02k *13/04*

U.S. Cl. 310—234 **4 Claims**



An armature for an electric motor has commutator segments, an armature coil structure consisting of coils having end portion which lead to the commutator segments and each of which has a looped part adjacent the associated commutator segment, and sleeves of yieldable resilient material snugly surrounding the looped parts. A moulded rigid mass of resinous material extends locally only in the region of the commutator and encapsulates the sleeves parts of the coil end portions and the connections of the end portions to the commutator segments. The yieldable nature of the sleeves permits a degree of relative movement of the looped parts within the moulded mass. A thin layer trickle coating of an electrically insulating material encases the parts of the coil structure not encapsulated in said mass.

3,697,793

ION BEAM DEFLECTION SYSTEM

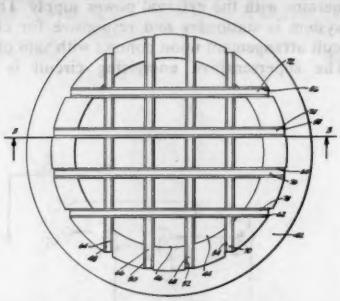
Harry J. King, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 9, 1970, Ser. No. 9,765

Int. Cl. F03h *5/00*

U.S. Cl. 313—63 **9 Claims**

A single electrode has an insulated face upstream in the direction of the ion beam so that a charge builds up thereon to serve as a screen electrode. The electrode defines openings, and these openings have electrode metal on the sides thereof. The electrode metal serves as an accelerator electrode, when an accelerator voltage is applied thereto. When electrodes on different sides of the openings have different voltages applied thereto, they serve to deflect the ions so that they no longer form a beam symmetric about the arcs. The electrode is formed by producing bars which consist of two electrodes



separated by electrically-insulative, glass-filled refractory, and with one edge of the bars optionally carrying an insulative nose thereon. These bars are assembled in egg crate configuration to define a plurality of electrode openings.

3,697,794

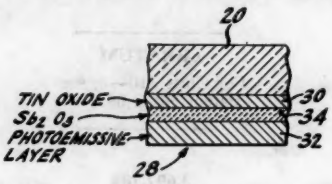
PHOTOCATHODE COMPRISING LAYERS OF TIN OXIDE, ANTIMONY OXIDE, AND ANTIMONY

Richard G. Stoudenheimer, Lancaster, and Rodger P. Dourte, Manheim, both of Pa., assignors to RCA Corporation

Continuation of Ser. No. 622,293, March 10, 1967, Pat. No. 3,436,164. This application March 19, 1969, Ser. No. 863,724

Int. Cl. H01j *39/06, 39/00*

U.S. Cl. 313—94 **5 Claims**



In a photocathode comprising a substrate of tin oxide having thereon a photoemissive coating including antimony, a layer of antimony oxide is interposed between the tin oxide substrate and the photoemissive coating.

3,697,795

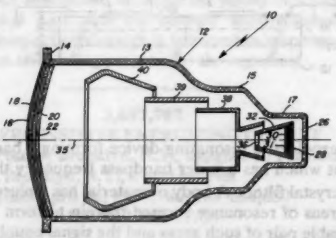
IMAGE INTENSIFIER TUBE HAVING A MULTI-RADIUS PHOTOCATHODE

Martin Braun, Stamford, Conn.; Stanley S. Grossel, and Barry M. Singer, both of New York, N.Y., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Nov. 20, 1970, Ser. No. 91,431

Int. Cl. H01j *39/00, 31/50*

U.S. Cl. 313—102 **9 Claims**



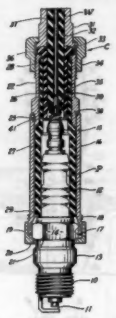
An image intensifier tube including a multi-radius photocathode having less curvature adjacent its periphery than in the central portion thereof.

3,697,796

SPARK PLUG SHIELDING

Russell G. Livingston, 6044 Rod Avenue, Woodland Hills, Calif.

Filed July 27, 1970, Ser. No. 58,592
Int. Cl. H01t *13/06*
U.S. Cl. 313—134 8 Claims



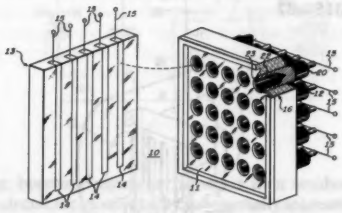
Shielding for spark plugs of internal combustion engines to prevent radio frequency interference and explosion, the shielding having a body surrounding the spark plug and engaged with the wrench portion of the spark plug and having a wrench portion to enable installation and removal of the spark plug, the body having at one end a threaded end piece securing the plug in place and being threaded at the other end to accommodate a spark plug connector terminal. Internally, the spark plug is encircled by an insulating sleeve, and a seal is provided to prevent entry of explosive gas into the body.

3,697,797

PROCESS FOR MANUFACTURING COLD CATHODE GAS DISCHARGE DEVICES AND THE PRODUCT THEREOF

Paul J. Freyheit, Framingham Center, and Claude D. Lustig, Lexington, both of Mass., assignors to Sperry Rand Corporation

Filed Jan. 25, 1971, Ser. No. 109,271
Int. Cl. H01j *1/94, 9/18, 17/48*
U.S. Cl. 313—217 9 Claims



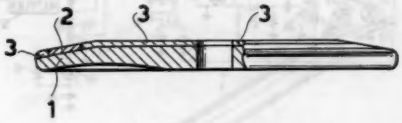
The invention comprises a process of manufacturing cold cathode gas discharge devices. A unitary metal electrode structure is inserted through a glass support, the metal and glass having the same coefficient of thermal expansion. The support and electrode structure are heated in the presence of oxygen to effect a seal therebetween. The gas discharge device is completed without removing the oxide coating formed on the electrode surfaces of the structure during the heating step. The resulting gas discharge device, which may be used for display purposes, has a stable oxide coating on electrodes thereof that attenuates display distorting reflections.

3,697,798

ROTATING X-RAY TARGET

Rudolf Machenschalk, and Herbert Wagner, both of Reutte, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed March 24, 1971, Ser. No. 127,507
Claims priority, application Austria, March 25, 1970, 2792/70
Int. Cl. H01j *35/10, 1/05, 1/38*
U.S. Cl. 313—330 11 Claims



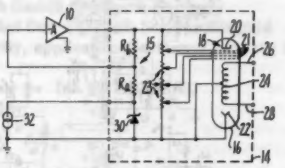
This invention relates to a rotating X-ray target made up of three metallic components, i.e., a molybdenum body, a focal track of an alloy of tungsten with one or more metal additives and a component present in the surface not exposed to electrons comprising tungsten alone or a tungsten alloy having a lesser amount of the additive metals.

3,697,799

TRAVELING-WAVE TUBE PACKAGE WITH INTEGRAL VOLTAGE REGULATION CIRCUIT FOR REMOTE POWER SUPPLY

John W. Caldwell, Palo Alto, and Edward M. Smith, San Jose, both of Calif., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Jan. 13, 1970, Ser. No. 2,589
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 10 Claims



A circuit is provided in a traveling-wave tube package which eliminates the need of manually setting the power supply voltage to match the proper operating voltage of the tube. The circuit utilized within the traveling-wave tube package forms a part of the power supply, the remainder of which is provided externally of the traveling-wave tube package. By selecting the proper circuit components, the traveling-wave tube package can be connected without adjustment to a power supply and still operates at the desired voltage.

3,697,800

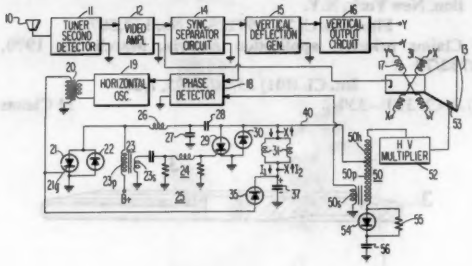
HIGH VOLTAGE HOLD DOWN CIRCUIT

John Joseph McArdle, Indianapolis, and Robert Louis Rauck, Greenfield, both of Ind., assignors to RCA Corporation

Filed May 11, 1970, Ser. No. 36,046
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 R 3 Claims

In a horizontal deflection circuit utilizing a voltage multiplier to develop the kinescope ultor voltage, a switching diode is coupled from the S-shaping capacitor in series with the deflection winding to a control element of a horizontal deflection output device to prevent the ultor voltage from increasing to an excessive level in the event the damper diode becomes open circuited. During normal operation, the voltage on the capacitor will reverse bias the switching diode, if however, the damper diode circuit opens, the capacitor voltage will cause

the switching diode to conduct to clamp the control element of the output device to the capacitor voltage which prevents



the horizontal output stage from developing excessive ultor voltage.

3,697,801

CIRCUIT ARRANGEMENT FOR PRODUCING A LINE-FREQUENCY SAWTOOTH-CURRENT HAVING A FIELD-FREQUENCY-VARYING AMPLITUDE IN A TELEVISION DISPLAY DEVICE

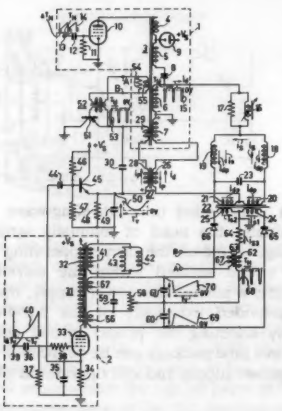
Hannspeter Eulenberg, Bauweg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 13, 1969, Ser. No. 832,957

Claims priority, application Netherlands, July 11, 1968, 6809798

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 TD **13 Claims**



A TV deflection circuit for producing a line frequency sawtooth current whose amplitude varies at the field frequency said variation being approximately parabolic to provide East - West raster correction for any pincushion distortion and approximately sawtooth shaped to provide color correction in the case of a color TV tube. The circuit includes a modulator having an electronic switch controlled by a line frequency signal. During the forward stroke of the constant amplitude sawtooth current supplied by a line deflection current generator to the line deflection coil, the switch connects a field deflection current generator to a resonant circuit including the parallel combination of a capacitor and an inductor. The inductor comprises either the line or field deflection coils, or both. The resonant circuit has a resonant period that is approximately twice the flyback time of the line frequency deflection current.

3,697,802

TWO-TERMINAL, TWO-COLOR INDICATOR LAMP ASSEMBLY

Nickolas P. Demas, Cranford, N.J., assignor to Wagner Electric Corporation

Filed Oct. 12, 1970, Ser. No. 79,737

Int. Cl. H01j *13/46*

U.S. Cl. 315—65 **6 Claims**

A two-terminal, two-color indicator lamp assembly comprising two separately energizable filaments positioned behind different-colored portions of the lamp envelope along the line of sight. The lamp envelope is mechanically connected to a pair of terminals to form a telephone slide base, and a pair of diodes is interconnected between said terminals and said filaments to enable energization of one filament only when the polarity of the first terminal is positive with respect to the polarity of the second terminal, and to enable energization of the other filament only when the polarity of said second terminal is positive with respect to the first terminal.

3,697,803

ROAD VEHICLE LIGHTING SYSTEM HAVING LIGHT REFLECTION MINIMIZING FINS

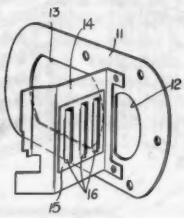
Harris Vernon Hicks, Lichfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 14, 1970, Ser. No. 97,965

Claims priority, application Great Britain, Dec. 17, 1969, 61,436/69

Int. Cl. B60q *1/02*

U.S. Cl. 315—82 **5 Claims**



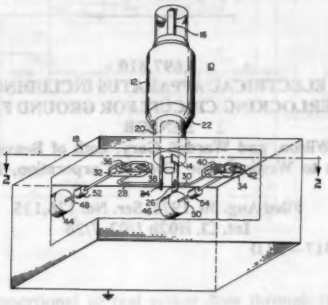
A lighting system for a road vehicle includes a casing housing a light receiver. The light receiver has associated therewith a lens which is supported by the casing, and which directs light from in front of the vehicle equipped with the system, into the receiver. The casing includes a vertical wall which extends parallel to the optical axis of the receiver, and in order to minimize the risk of reflection of light from the wall into the receiver the wall is provided with a plurality of vertical fins which extend towards the optical axis of the receiver. The fins also extend forwardly towards the lens.

3,697,804

MICROWAVE GENERATING APPARATUS INCLUDING SPURIOUS SIGNAL SUPPRESSION MEANS

Harold C. Anderson, New Brighton, and David F. Graff, Minneapolis, both of Minn., assignors to Litton Systems, Inc.

Filed Oct. 12, 1970, Ser. No. 79,764
Int. Cl. H05b *39/00*
U.S. Cl. 315—105 5 Claims



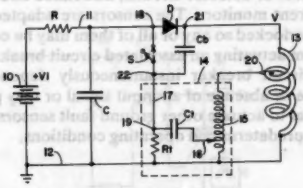
A microwave generating apparatus is disclosed which includes suppression means for preventing high frequency signals from being propagated out of the apparatus through its cathode terminals to be radiated away from the apparatus. The suppression means includes a shield member and a non-saturating ferrite member positioned around each of the cathode heater leads of the apparatus within the shield member. The ferrite member comprises an elongated ferrite body having at least two apertures extending therethrough, with the lead element traversing both of these apertures in opposing directions.

3,697,805

GAS DISCHARGE LAMP FIRING CIRCUIT

Henry N. Switsen, 11319 Van Owen St., North Hollywood, Calif.

Filed May 28, 1969, Ser. No. 828,605
Int. Cl. H05b *41/32*
U.S. Cl. 315—241 P 3 Claims



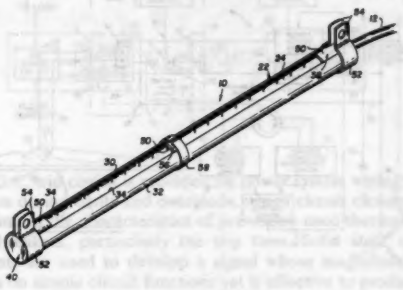
A voltage boosting means is provided in a stroboscopic lamp firing circuit for momentarily substantially increasing the available voltage for firing the lamp at the precise point in time that the normal striking means is operated to ready the lamp for firing. The momentary substantial increase in voltage for firing the lamp is provided by a capacitor which is charged to or partly to the normal firing voltage prior to initiation of the striking means for the lamp. A switch means utilized to initiate the striking means also serves to apply a voltage to one side of the capacitor to thereby momentarily substantially increase the voltage on the other side of the capacitor relative to ground. Since the boosted voltage occurs precisely upon operation of the switch means which operation also operates the striking means, the substantially increased voltage is provided at the proper time for assuring firing of the lamp.

3,697,806

ION GENERATOR

William C. Herbert, Jr., Mill Neck, N.Y., assignor to Herbert Products, Inc., Westbury, N.Y.

Filed April 22, 1971, Ser. No. 136,340
Int. Cl. H05f *3/06*
U.S. Cl. 317—2 F 7 Claims



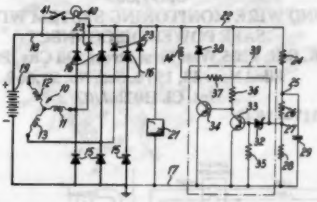
An ion generator having an electrical cable for producing a corona field for capacitors having emitter electrodes discharging ions toward a grounded shield that protects the electrodes from accidental touching and discharge and causes the ions to assume an enlarging path of ion discharge.

3,697,807

BIPOLAR CIRCUIT DEVICE

Klaus H. Christ, Stuttgart-Durrlewang, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 19, 1969, Ser. No. 886,624
Claims priority, application Germany, Jan. 10, 1969, P 19 01 075.4
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 12 Claims

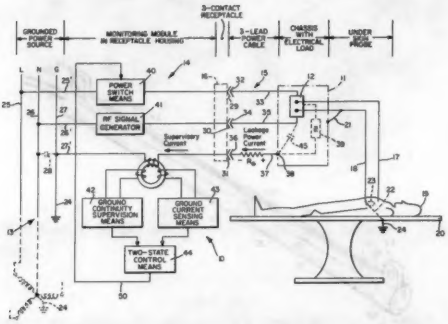


A protective arrangement in which a bipolar circuit device is connected across the terminals of a voltage source with voltage monitored through a voltage regulator connected to the source. The bipolar device contains two transistors of opposite conductivity type interconnected so as to exhibit low internal resistance when the output voltage from the source lies within predetermined operating limits. When the output voltage from the source exceeds a predetermined limit, due to failure of the voltage regulator, for example, the internal resistance of the bipolar device drops sharply and substantially short-circuits the terminals of the generator. The change in resistance is made permanent through destruction of the transistors as a result of heat dissipation.

3,697,808
SYSTEM FOR MONITORING CHASSIS POTENTIAL AND GROUND CONTINUITY

Joo Chan Lee, Lindenhurst, Ill., assignor to The Safety Company, St. Charles, Ill.

Filed Nov. 23, 1970, Ser. No. 91,617
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 A **23 Claims**

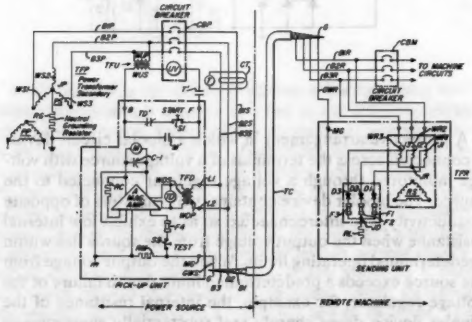


A monitoring system controls the application of power from a grounded power source to an electrical load in a chassis connected to the source by the line, neutral and ground leads of a power cable. Control is exerted by monitoring the level of leakage power current flowing in the ground lead of the cable and disconnecting the power source from the line lead of the cable when the level is such that a 5 millivolt drop would occur across the ground lead. This maintains the chassis at a potential of no more than 5 millivolts with respect to ground. An RF signal injected into the neutral lead of the cable causes RF current to flow in the ground lead by reason of the capacitive coupling between the load and the chassis when continuity exists between the chassis and the source ground. The RF current is monitored in order to disconnect the power source when such current drops below a predetermined level indicating that an inadequate or insufficient connection exists between the chassis and ground, situations that interfere with properly monitoring the level of leakage power current through the ground lead.

3,697,809
GROUND WIRE MONITORING SYSTEM WITH FAIL-SAFE POWER DISCONNECT

William R. Self, 1205 West First Street, Oil City, Pa.

Filed Nov. 23, 1970, Ser. No. 91,669
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 C **11 Claims**

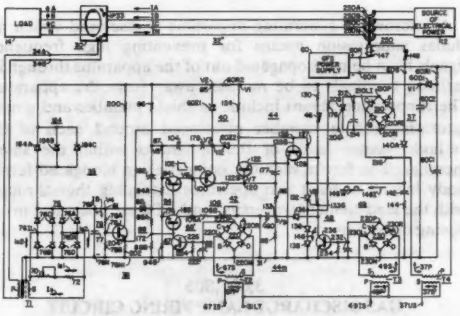


A system for monitoring the continuity of a ground wire between a remote machine, such as a mining machine, and a power source supplying polyphase power to the machine via a plurality of conductors wherein a DC signal is provided at the machine in response to the purchase power. The DC signal is applied to the ground wire for transmission to the power source, with the receipt of the DC signal at the power source being indicative of continuity of the ground wire and the absence of the DC signal being indicative of non-continuity, such latter indication being employable to disconnect the power from the remote machine.

3,697,810
ELECTRICAL APPARATUS INCLUDING INTERLOCKING CIRCUIT FOR GROUND FAULT SENSOR

John I. Wilson, and Wardell Gary, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1971, Ser. No. 176,115
Int. Cl. H02h *1/02, 7/26*
U.S. Cl. 317—18 D **14 Claims**



A ground fault sensor circuit adapted to provide output signals and receive input signals as part of an overall ground fault detection system including a plurality of such ground fault sensor or detector circuits, associated circuit interrupters and current monitors. The sensors are adapted to be electrically interlocked so any or all of them may be completely disabled from actuating an associated circuit breaker or may actuate a circuit breaker instantaneously depending upon the presence or absence of an input signal or may provide an output signal to actuate other ground fault sensors or give indications of predetermined operating conditions.

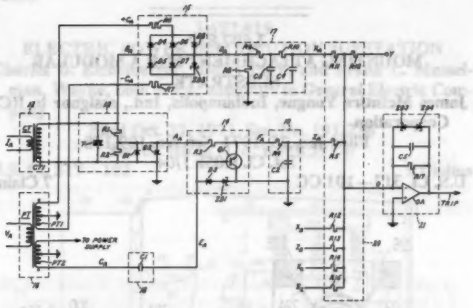
3,697,811
STATIC NETWORK PROTECTIVE RELAY

David W. Little, Lansdowne, Pa., assignor to General Electric Company

Filed Sept. 10, 1971, Ser. No. 179,500
Int. Cl. H02h *3/36*
U.S. Cl. 317—27 R **11 Claims**

A static protective relay comprises a power directional unit for controlling a circuit breaker which couples a primary feeder or a source of supply of a 3-phase power distribution system to an alternating current secondary network through a network transformer. The power directional unit senses reverse power flow above a preselected threshold level from the network to the network transformer to energize a tripping coil of the circuit breaker. Included in the power directional unit is a voltage deriving circuit producing a voltage propor-

tional to the system current through the circuit breaker, a modulator which modulates the voltage by a voltage proportional to the system voltage at the circuit breaker to obtain an



output proportional to real power flow through the circuit breaker, and a detector which energizes the tripping coil upon the presence of a reverse power flow signal from the modulator. The power directional unit also includes a source of variable bias comprising circuitry for providing a bias signal which varies both in magnitude and in phase and is a function of the phase angle of the phase current. The variable bias is supplied as an input to the detector to provide a power directional unit exhibiting improved sensitivity to highly capacitive phase currents.

3,697,812

AUTOMATIC SAFETY SWITCH FOR ELECTRIC CURRENT LOAD

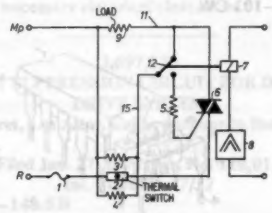
Karl Hehl, Siedlung 183, D 7291 Lossburg, Germany

Filed April 8, 1971, Ser. No. 132,508

Claims priority, application Germany, April 11, 1970, P 20 17 422.5

Int. Cl. H02h 7/00

U.S. Cl. 317—33 SC **12 Claims**



An automatic safety circuit for monitoring the power switching means controlling the main current circuit to an electric power load to automatically cut off the current in the event of a malfunction of the power switching means which causes it to continue to remain in its closed condition. The auxiliary switching circuit includes a switching arrangement for selectively disrupting the main current circuit, and an auxiliary switch controlled by the same member or circuit which controls the main power switching means for establishing a current path between the switching arrangement and a point in the main current circuit between the load and the main power switching means whenever the main current to the load is to be switched off.

3,697,813

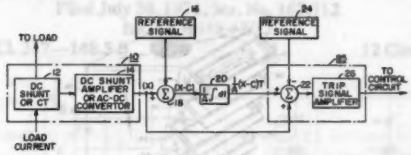
TRIPPING CIRCUIT FOR STATIC SWITCHES

David A. Fox, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 15, 1971, Ser. No. 124,309

Int. Cl. H01h 47/18

U.S. Cl. 317—36 TD **3 Claims**



A D.C. trip circuit is provided for power system wiring protection during faults and overloads, which circuit closely approximates the characteristics of previously used thermal circuit breakers, particularly the trip time. Solid state components are used to develop a signal whose magnitude depends on simple circuit functions yet is effective to produce a trip signal wherever its magnitude is equal to or greater than zero. The trip time is close to that resulting from an I^2T (load current squared times trip time) value while requiring simpler, and hence more reliable, components to determine.

3,697,814

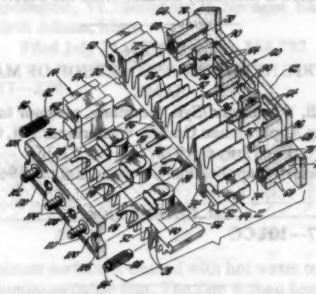
BRIDGE RECTIFIER HEAT SINK ASSEMBLY

Willard A. Christman, and Billy R. Jones, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed June 21, 1971, Ser. No. 154,900

Int. Cl. H01l 1/12

U.S. Cl. 317—100 **4 Claims**

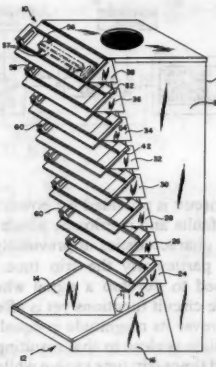


A bridge rectifier assembly and method for manufacture includes a pair of heat sinks in mating relationship for forming a center opening wherein two groups of oppositely poled semiconductor diodes are mounted on mutually facing interior walls of the pair of heat sinks. An insulating plate extends across one end of the pair of heat sinks to cover one end of the center opening. The inner side of the insulating plate includes an integral set of spacer blocks and stud fasteners. Opposing slots formed in the interior walls receive the stud fasteners to attach the pair of heat sinks together and to the insulating plate. This positions the spacer blocks within the center opening and between the diodes. A terminal board covers the center opening at the opposite end of a pair of heat sinks and is held in place by the free ends of the spacer blocks. Input terminals carried by the terminal board are connected to the diodes to complete the assembly.

3,697,815
COOLING HOOD FOR SUPPORTING PRINTED CIRCUIT BOARDS DURING BURN-IN

John Grant, Contoocook, and Miner R. Longley, Pembroke, both of N.H., assignors to Aerotronic Associates, Inc., Contoocook, N.H.

Filed Aug. 23, 1971, Ser. No. 173,891
Int. Cl. H05k 7/20
U.S. Cl. 317—100 5 Claims

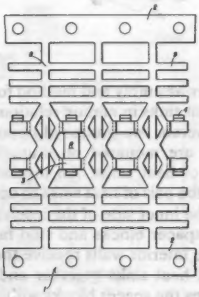


Apparatus for burn-in of printed circuit boards, particularly a hood with electrical connections, supporting the printed circuit boards or trays in superposed, staggered relationship, and angularly disposed from the horizontal, so that the semi-conductors under test are exposed outwardly in ambient air and the power-dissipating load resistors are exposed inwardly. Heat shields below the individual boards reduces thermal interaction between trays. The heat from the load resistors rises vertically with entrained air through the top of the hood. Since the boards are staggered, and angularly disposed, fresh ambient air is enhancingly entrained at each level with the result that each board is thermally isolated from the other.

3,697,816
ELECTRIC NETWORK AND METHOD OF MAKING SAME

Helmut Dull, Westerland/Sylt, Germany, assignor to Bernhard Beyschlag Apparatebau GmbH, Westerland/Sylt, Germany

Filed July 6, 1970, Ser. No. 52,356
Claims priority, application Germany, July 5, 1969, P 19 34 238.2
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CC 18 Claims

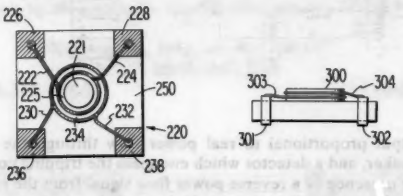


An electrical network has a carrier-free, self-supporting grid system prefabricated in one piece of an electrically conductive material. The grid system defines a plurality of electrically conductive paths. A predetermined number of various electrical components are mounted on the grid system in predetermined locations, and predetermined ones of the defined conductive paths are severed. The self-supporting grid system may be constructed as a continuous tape and cut to the desired size; and the predetermined paths may be severed by stamping or cutting.

3,697,817
MOUNTING ATTACHMENT FOR A MODULAR SUBSTRATE

James McIntire Yongue, Indianapolis, Ind., assignor to RCA Corporation

Filed Jan. 25, 1971, Ser. No. 109,158
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CC 7 Claims

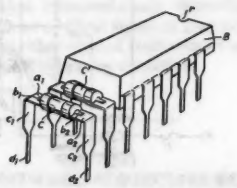


An intermediate structure is used to mount such inductive elements as coils and transformers to a significantly larger module substrate. The intermediate substrate is provided with a metalization around its edges to afford an electrical connection between the leads of the inductive element—secured at the top of the intermediary—and the module substrate—to which the metallization at the bottom of the intermediary is electrically connected. The package so formed facilitates the construction of a ceramic circuit far more simply than if the inductive element were itself secured directly to a modular substrate of ceramic material.

3,697,818
ENCAPSULATED CORDWOOD TYPE ELECTRONIC OR ELECTRICAL COMPONENT ASSEMBLY

Rene A. Boursin, Suresnes, France, assignor to Sovcor Electronique, Le Vesinet, France

Filed Jan. 25, 1971, Ser. No. 109,267
Claims priority, application France, Jan. 23, 1970, 7002443
Int. Cl. H05k 1/18
U.S. Cl. 317—101 CW 7 Claims



A planar sheet of conductive material is cut or etched by any suitable means to define two parallel rows of parallel contact strips each of which is formed at its outermost end as a connector pin suitable for insertion into a printed circuit board. The innermost ends of each row define opposed contact tabs to which the opposed contact pins of an electronic component may be secured by soldering. One or more selected tabs in a row may be joined to each other by a connecting strip extending lengthwise along the row and selected tabs and/or connecting strips may be bent perpendicular to the planar sheet to define additional planes of contact attachment points parallel to the planar sheet to enable electronic components to be arranged in one or more parallel

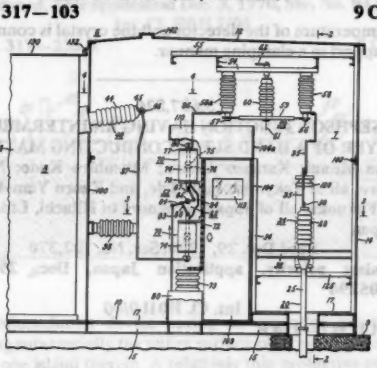
planes for connected between selected contact tabs in each row of contact strips. The connected components may then be encapsulated in a plastic material. The connector pin ends of each contact strip are then electrically separated from each other and bent into two planar rows perpendicular to the planar sheet for insertion into a suitable printed circuit plug board.

3,697,819

ELECTRIC POWER DISTRIBUTION SUBSTATION

Charles D. Eichelberger, Ridley Park, and Frank L. Musselman, Wayne, both of Pa., assignors to General Electric Company

Filed Oct. 21, 1971, Ser. No. 191,238
Int. Cl. H02b *1/18*; H01h *31/00*
U.S. Cl. 317—103 **9 Claims**



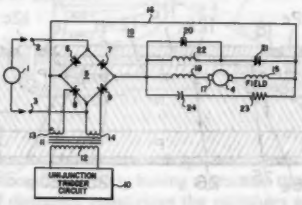
An incoming line compartment for an electric power distribution substation. The compartment comprises a metal housing containing incoming line equipment for connecting a high voltage line to the terminals of a transformer, for disconnecting it therefrom, and for providing certain fault protection and surge protection. The incoming line equipment comprises the following devices: high voltage cables entering the compartment from underground, an isolating switch suspended from a base near the roof of the metal housing, a vacuum switch, and means connecting these devices in series with each other and with the terminals of the transformer. The vacuum switch is horizontally spaced from the cables, and an inspection aisle extends between the vacuum switch and the cables beneath a horizontally movable blade of the isolating switch. This arrangement is especially compact and lends itself to being enclosed by a housing of relatively small size that leaves space for the necessary electrical clearances.

3,697,820

TRANSIENT SUPPRESSION CIRCUIT FOR D. C. MOTOR DRIVE SYSTEM

Robert J. Ehret, Los Altos, Calif., assignor to Beckman Instruments, Inc.

Filed Jan. 27, 1971, Ser. No. 110,011
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 B **4 Claims**



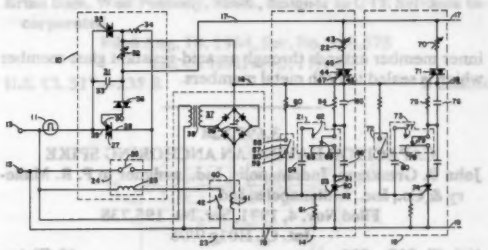
A control circuit for a d.c. system including a transient suppression network connected in parallel with an inductive load and comprising a plurality of series connected, like poled, unidirectional current conducting elements, such as diodes, and an inductive impedance connected in parallel with at least one of the unidirectional current conductive elements.

3,697,821

LIGHT DIMMING SYSTEM HAVING MULTIPLE CONTROL UNITS

James C. Johnson, Arlington, Tex., assignor to Hunt Electronics Company, Dallas, Tex.

Filed July 30, 1971, Ser. No. 167,712
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 B **12 Claims**



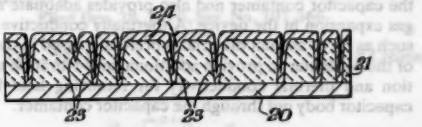
A plurality of separate remote control units are provided for individually and independently controlling the operation of a common lamp dimmer unit. Each remote control unit is capable of turning on and off the lamp dimmer unit and of controlling the brightness of the lamp or lamps independently of the previous setting or condition of any of the other remote control units. The various remote control units are connected in parallel with one another and with the remainder of the system by a three-wire conductor system.

3,697,822

ELECTROLYTIC CAPACITOR HAVING AN ELECTRODE WITH A METALLIZED CRACKED OXIDE SURFACE

Robert S. Alwitt, Williamstown, Mass., and Robert W. Santway, Bennington, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed July 21, 1971, Ser. No. 164,792
Int. Cl. H01g *9/04*
U.S. Cl. 317—230 **19 Claims**



An aluminum surface is treated with hot water to produce a hydrous aluminum oxide film. The film is then heated treated so as to crack the oxide film. A thin film of aluminum is then deposited over this skeletal structure, and the resulting thin film contacts the original aluminum surface through the cracks in the oxide film. A high surface area electrode that is economical to manufacture is obtained in this fashion.

3,697,823

METAL-TO-GLASS-TO-METAL HERMETIC SEAL

Edward Max Correll, Columbia, S.C., assignor to General Electric Company

Continuation-in-part of Ser. No. 889,004, Dec. 29, 1969, Pat. No. 3,624,460. This application Nov. 3, 1971, Ser. No. 195,295
Int. Cl. H01g *9/10*
U.S. Cl. 317—230 **7 Claims**

A hermetic metal-to-glass-to-metal seal for a sealed casing is disclosed comprising an outer metal member and an inner

metal member, one of which is a film-forming metal. The

inner member extends through an acid-resistant glass member which is sealed to both metal members.

3,697,824

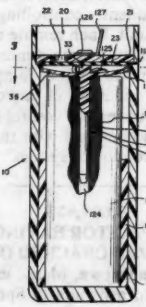
CAPACITOR HAVING AN ANCHORING SPIKE

John B. Greskamp, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Nov. 4, 1971, Ser. No. 195,738

Int. Cl. H01g 9/06

U.S. Cl. 317—230 **12 Claims**



An electrolytic capacitor is described having an anchoring spike between the capacitor body and the capacitor seal which stabalizes the capacitor body from movement with respect to the capacitor container and also provides adequate space for gas expansion in the device. A thermally conductive medium such as tar or asphalt material is preferably used in the bottom of the container to provide additional anti-vibration stabalization and thermal conductivity for removing heat from the capacitor body out through the capacitor container.

3,697,825

RADIATION DETECTOR

Johannes Meuleman, and Michel Aussant, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

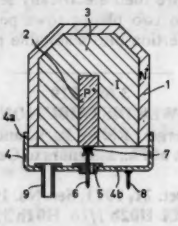
Filed Jan. 26, 1971, Ser. No. 109,782

Claims priority, application France, Jan. 26, 1970, 7002618; Dec. 4, 1970, 7043724

Int. Cl. H01l 15/00

U.S. Cl. 317—234 R **7 Claims**

A method of connecting a semiconductor crystal of a radiation detector to a support, for example, a Ge-Li detector, in which the support is constructed with a connection part the shape of which is adapted to a circumferential connection surface which is present on a side face or in a cavity of the crystal. Prior to the connection, the connection part of the support is brought to a temperature which differs from the operating temperature of the radiation detector, after which the support and the crystal are slid one into the other until the connection part of the support is located opposite to the connection surface of the crystal. The support is then brought to the operat-



ing temperature of the detector and the crystal is connected to the support in a clamping manner.

3,697,826

JOSEPHSON JUNCTION HAVING AN INTERMEDIATE LAYER OF A HARD SUPERCONDUCTING MATERIAL

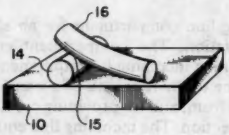
Masao Mitani; Katzuzo Aihara; Mitsuhiro Kudo; Nobuhiro Hara, all of Tokyo-to; Fujio Irie, and Kaoru Yamafuji, both of Fukuoka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1970, Ser. No. 102,370

Claims priority, application Japan, Dec. 29, 1969, 44/105294

Int. Cl. H01l 9/00

U.S. Cl. 317—234 R **8 Claims**



Superconducting element using the Josephson effect formed by first and second layers of a soft superconducting material having a third layer of a hard superconducting material interposed therebetween, the third layer having a lower critical magnetic field which is smaller than the critical magnetic fields of said first and second layers.

3,697,827

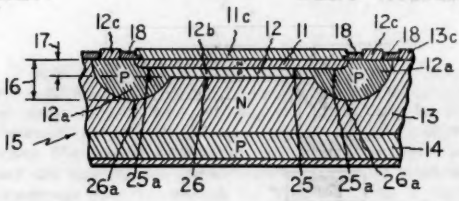
STRUCTURE AND FORMATION OF SEMICONDUCTORS WITH TRANSVERSE CONDUCTIVITY GRADIENTS

Edward Simon, Manchester, Mass., assignor to Unitrode Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 626,900, March 29, 1967, abandoned. This application Feb. 9, 1971, Ser. No. 113,932

Int. Cl. H01l 5/00

U.S. Cl. 317—235 **11 Claims**



An electrical semiconductor device in which the impurity concentration of a conduction region of independently controlled depth is graded in a direction parallel to an associated

junction to provide varying areas of conduction across the junction with varying total junction current. The effect on junction performance by the transverse impurity gradients in the conduction region counteracts detrimental effects of current crowding and provides other improved device operating characteristics.

3,697,828

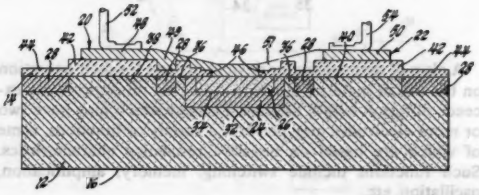
GEOMETRY FOR A PNP SILICON TRANSISTOR WITH OVERLAY CONTACTS

James A. Oakes, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 846,378, July 31, 1969, abandoned. This application Dec. 3, 1970, Ser. No. 94,854

Int. Cl. H01l 5/06

U.S. Cl. 317—235 R **8 Claims**



A semiconductor device having an expanded guard ring overlying substantially the entire surface of a region except for at least one island therein. A relatively thin protective coating overlies the guard ring and a relatively thick protective coating overlies the island. A terminal connector contact for a wire-bonded or flip-chip device formed on the relatively thick island portion of the protective coating, which is more suitable for withstanding bonding pressure. One form of this device includes a PNP transistor having an expanded P+ guard ring overlying a substantial portion of the collector surface noncontiguously closely surrounding the base region of the transistor. Islands of original P-type material having a relatively thick oxide coating thereon are left within the expanded P+ guard ring to support wire-bonding or flip-chip contact pads.

3,697,829

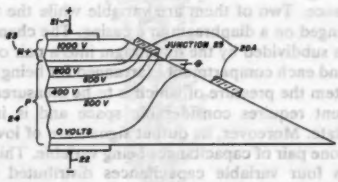
SEMICONDUCTOR DEVICES WITH IMPROVED VOLTAGE BREAKDOWN CHARACTERISTICS

Gerald C. Huth, Malvern, Pa., and Robert L. Davies, Auburn, N.Y., assignors to General Electric Company

Division of Ser. No. 255,037, Jan. 30, 1963, Pat. No. 3,491,272. This application Dec. 30, 1968, Ser. No. 812,502

Int. Cl. H01l 11/00

U.S. Cl. 317—235 R **10 Claims**



To improve the reverse voltage breakdown characteristics of a semiconductor body having a junction therein formed by zones of dissimilar resistivities the periphery of the body adjacent the junction is beveled. With a positive bevel (lowest cross section zone having the highest resistivity) the reverse voltage breakdown characteristics improve progressively as the angle between the junction and the beveled periphery decreases. With a negative bevel (highest cross section zone having the highest resistivity) the reverse voltage breakdown characteristics are typically optimal in the range of from 4° to 9°. With a dielectric coating on the beveled periphery the angle range may be extended to from 1° to 25°. With two-junction bodies, for example semiconductor rectifiers and controlled rectifiers, having a higher resistivity N or P central zone between P or N zones, respectively, of lower resistivity, a combination of positive and negative bevels may be employed with like or dissimilar bevel angles at each junction.

3,697,830

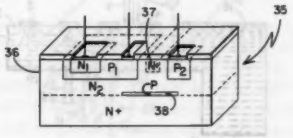
SEMICONDUCTOR SWITCHING DEVICE

Brian Dale, West Peabody, Mass., assignor to GTE Sylvania Incorporated

Filed Aug. 10, 1964, Ser. No. 388,575

Int. Cl. H01l 9/12, 11/10

U.S. Cl. 317—235 R **2 Claims**



Semiconductor switching device having four zones of semiconductor material of alternating conductivity type with surface areas in a common surface. An ohmic gate connection to the one of the intermediate zones which is the gate at its surface area is located intermediate the ohmic connections to the terminal zones. Current flow from one terminal zone toward the other terminal zone adjacent the surface of the device while the device is "on" may be withdrawn at the gate connection before it reaches the vicinity of the other terminal zone in order to turn the device "off." The turn-off characteristics of the device are thereby improved.

3,697,831

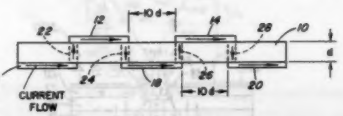
SERIES ELECTRICAL, PARALLEL THERMAL GUNN DEVICES

Wallace E. Anderson, Beltsville; Albert D. Krall, Rockville, and Albert M. Syeles, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 28, 1970, Ser. No. 101,566

Int. Cl. H01l 5/02

U.S. Cl. 317—235 R **8 Claims**



A plurality of Gunn devices are electrically connected in series and thermally connected in parallel and include a layer of active semiconductive material, a first plurality of electrical contacts disposed along one side of the active semiconductive material and a second plurality of electrical contacts disposed along another side of the active semiconductive material. The electrical contacts disposed along one side of the semiconductive layer overlap corresponding electrical contacts disposed along the other side of the active semiconductive layer to form a plurality of Gunn devices in the active semiconductive layer defined by the overlapping areas of the electrical contacts. In one embodiment of the invention, the electrical contacts on one side of the semiconductive layer alternate with the electrical contacts on the other side of the semiconductive layer such that the end portions of the respective contacts disposed along

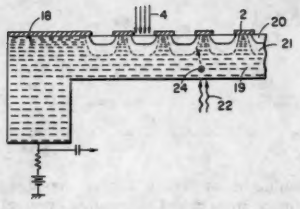
opposite sides of the semiconductive material overlap. In an alternate embodiment of the invention, the electrical contacts disposed along one side of semiconductive layer are connected by microstrip transmission lines located on heat sink such that the plurality of Gunn devices are locked in phase.

3,697,832

PLURAL PHOTO-DIODE TARGET ARRAY

Masafumi Hanaoka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1971, Ser. No. 108,301
Claims priority, application Japan, Jan. 23, 1970, 45/6645
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R 1 Claim



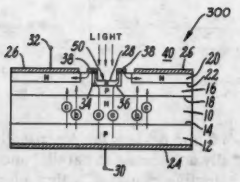
A plural photo-diode array, used as a target for silicon visicon image transmitting apparatus, employs a substrate having an impurity concentration profile which decreases about one substrate surface. The diodes are formed by diffused areas at that substrate surface comprising an impurity of opposite conductivity types.

3,697,833

LIGHT ACTIVATED THYRISTOR

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1971, Ser. No. 116,358
Claims priority, application Japan, Feb. 20, 1970, 45/14600
Int. Cl. H01l *15/00, 9/12*
U.S. Cl. 317—235 R 6 Claims



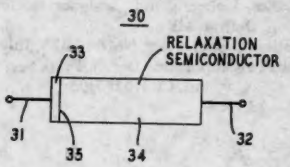
The disclosed thyristor includes an annular N emitter layer disposed on a P base layer to encircle the central portion of the latter. Another N emitter layer is disposed on the exposed surface of the central base portion to form an auxiliary thyristor around which a main thyristor is formed. The auxiliary thyristor responds to light falling upon its emitter layer to be fired. A current flowing through the fired thyristor flows into the annular emitter layer through a gate electrode bridging the auxiliary emitter layer and P base layer to fire the main thyristor.

3,697,834

RELAXATION SEMICONDUCTOR DEVICES

Horace Craig Casey, Jr., and Willy Werner van Roosbroeck, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1971, Ser. No. 110,140
Int. Cl. H01l *3/20, 5/00*
U.S. Cl. 317—237 8 Claims



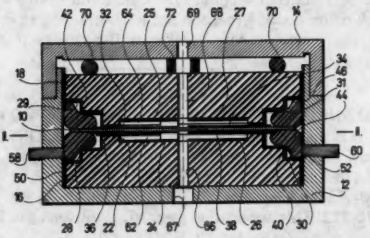
A class of semiconductor devices depend for their operation on the use of material in which dielectric relaxation time exceeds diffusion-length lifetime. Devices which may have two or more electrodes may perform a variety of functions, some of which are based on negative resistance characteristics. Such functions include switching, memory, amplification, oscillation, etc.

3,697,835

CAPACITIVE PRESSURE TRANSDUCER

Gyula Satori, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary

Filed May 24, 1971, Ser. No. 145,087
Claims priority, application Hungary, May 25, 1970, 1227
Int. Cl. H01g *7/00*
U.S. Cl. 317—246 2 Claims



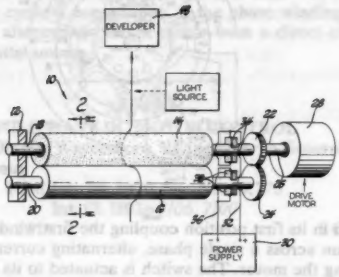
Known capacitive pressure transducers comprise a wheatstone bridge connection in each branch of which there is a capacitance. Two of them are variable while the two others are arranged on a diaphragm in a casing. The chamber of the casing is subdivided by the diaphragm into a pair of compartments and each compartment is arranged for being connected to a system the pressure of which is to be measured. Such arrangement requires considerable space and is intricate to manipulate. Moreover, its output signals are of low level due to only one pair of capacitances being variable. This invention employs four variable capacitances distributed in the individual branches of a Wheatstone bridge connection for which purpose four electrodes are supported on opposite sides of the diaphragm. Further four electrodes are arranged within the casing opposite to the electrodes on the diaphragm. Thus, four variable capacitances are formed which are connected to form a wheatstone bridge connection. Deflections of the diaphragms caused by such pressure entail variations of the bridge capacitances and, thereby output voltage signals of increased strength on the bridge terminals.

3,697,836

CERAMIC ELECTRICAL RESISTOR ROLL FOR COPYING MACHINE

James R. Moss; Richard F. Roe; Lawrence E. Coubrough, all of Golden, and Robert W. Buck, Wheatridge, all of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed June 3, 1970, Ser. No. 43,083
Int. Cl. G03g *15/02*; H01b *1/06*; C04b *33/26*
U.S. Cl. 317—262 A 6 Claims



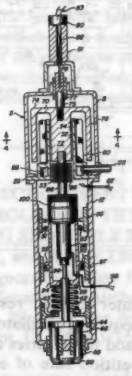
An electrostatic copying assembly including a pair of adjacent, parallel and oppositely driven rolls, one of which has a radially outer portion of fired silicate clay base ceramic material which is doped with iron oxide and a radially inner portion of conductive material to form part of the charging circuit.

3,697,837

ELECTROMAGNETIC FORCE SYSTEM FOR INTEGRATED CIRCUIT FABRICATION

Charles Wayne Umbaugh, Phoenix, Ariz., assignor to General Electric Company

Filed Oct. 5, 1970, Ser. No. 78,039
Int. Cl. H02k *33/14*
U.S. Cl. 318—128 6 Claims



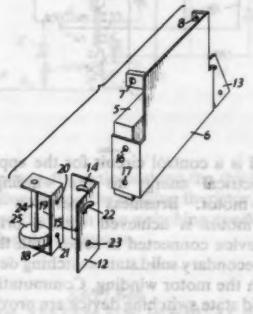
A feedback controlled spacial-force mechanism is used with a variety of tools for integrated circuit fabrication. The mechanism utilizes a force producing element having a force which may be held constant over a practical range of displacement.

3,697,838

SPEED CONTROL SYSTEM FOR A LINEAR INDUCTION MOTOR

John D. New, Denham, Bucks, England, assignor to The Harefield Rubber Company Limited, Harefield, England

Filed June 5, 1970, Ser. No. 43,795
Claims priority, application Great Britain, June 6, 1969, 28,721/69
Int. Cl. H02k *41/02*
U.S. Cl. 318—135 11 Claims



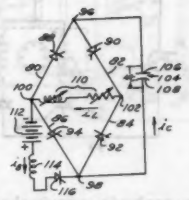
A linear induction motor particularly applicable for actuating a sliding door and having a speed control system comprising means for varying the air gap between the primary and secondary members during relative linear movement between the members.

3,697,839

BRIDGE CIRCUIT CONTROLLER AND PROCESS FOR SUPPLYING ELECTRICAL ENERGY TO A VARIABLE RELUCTANCE MOTOR

Lewis E. Unnewehr, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed March 8, 1971, Ser. No. 121,654
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 11 Claims



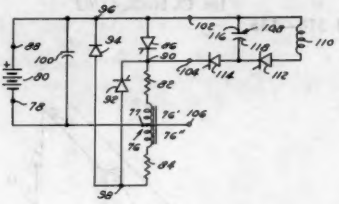
Described is a control circuit for the application of direct current electrical energy to the winding of a variable reluctance motor. Brushless operation of a variable reluctance motor, and torque and speed control thereof, may be achieved with controller circuitry including a four-arm electrical bridge, each of the four bridge arms including a solid state switching device. A capacitor is connected to the bridge and may be connected across one pair of opposed terminals of the bridge, and the motor winding is connected between the other pair of opposed terminals of the bridge. The energy source is connected to the bridge. At least one other solid state switching device is provided, this having one of its terminals connected to the energy source and another connected to the bridge.

3,697,840

CONTROLLER FOR VARIABLE RELUCTANCE MOTOR

Wolf H. Koch, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed March 8, 1971, Ser. No. 121,656
Int. Cl. H02k 29/00
U.S. Cl. 318—138 28 Claims



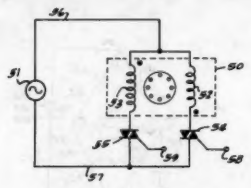
Described is a control circuit for the application of direct current electrical energy to the winding of a variable reluctance motor. Brushless operation of the variable reluctance motor is achieved with a primary solid state switching device connected in series with the motor winding and with a secondary solid state switching device connected in parallel with the motor winding. Commutation means for the primary solid state switching device are provided and a rectifier returns energy from the winding to the direct current source. Several possible circuit configurations for the commutation means are described. The control circuit may be used to provide rapid rise of motor winding ampere-turns, maintenance thereof at a high level, and rapid decline thereof with efficient return of magnetic energy to the DC source.

3,697,841

INDUCTION MOTOR STRUCTURE AND REVERSING CIRCUIT THEREFOR

Arne M. Nystuen, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed April 16, 1971, Ser. No. 134,579
Int. Cl. H02p 1/42
U.S. Cl. 318—207 A 13 Claims



An induction motor having a squirrel cage rotor is provided with an additional stator winding which when energized in proper sequence with the original stator winding causes a rapid reversal of the motor. The additional stator winding may be located on the same axis as the original stator winding or may be spaced 90 electrical degrees from the original winding.

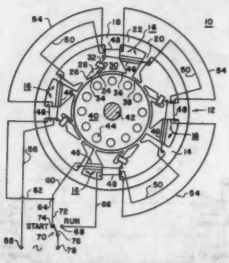
3,697,842

HIGH STARTING TORQUE ECCENTRIC WINDING SHADED POLE MOTOR

Wayne J. Morrill, 3448 S. Washington Road, Fort Wayne, Ind.

Filed May 20, 1971, Ser. No. 145,401
Int. Cl. H02p 1/44
U.S. Cl. 318—221 R 8 Claims

A single phase, shaded pole, alternating current induction motor which includes a stator core member having at least one pair of pole piece assemblies. Each pole piece assembly comprises first and second portions, the first portion having a shading coil thereon on the side thereof remote from the second portion which forms shaded and unshaded sections of the first pole piece portion. A first coil embraces each pole piece assembly and a second coil embraces the first portion only of each pole piece assembly. The first coils are connected in series to form a first winding and the second coils are also connected in series to form a second winding, the first and second windings being connected in series. A speed-responsive switch is provided having first and second positions, the



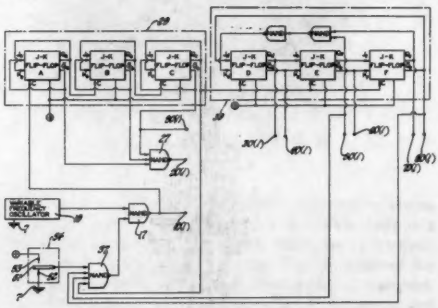
switch in its first position coupling the first winding for energization across a single phase, alternating current source for starting the motor. The switch is actuated to its second position in response to a predetermined motor speed in which both the first and second windings are serially coupled for energization across the source. The coils on each of the pole pieces are arranged so that upon energization of both the windings the unshaded pole piece sections respectively have greater magnetomotive force therein than the second pole piece portions.

3,697,843

THREE-PHASE INVERTER CONTROL CIRCUIT

Joseph A. Riess, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,225
Int. Cl. H02p 5/40
U.S. Cl. 318—227 10 Claims



A three-stage counter circuit, responsive to the output signals of a variable frequency oscillator, produces three series of logic level signals and three series of complementary logic level signals, the repetition rate of each signal series being one-half the repetition rate of the series of the next highest repetition rate. A three-stage shift register circuit, responsive to the series of logic level signals of the lowest repetition rate, produces a repeating series of six electrical timing signals. An inverter silicon controlled rectifier NAND gate corresponding to each inverter silicon controlled rectifier produces a series of inverter silicon controlled rectifier trigger signals in response to the output signals of the variable frequency oscil-

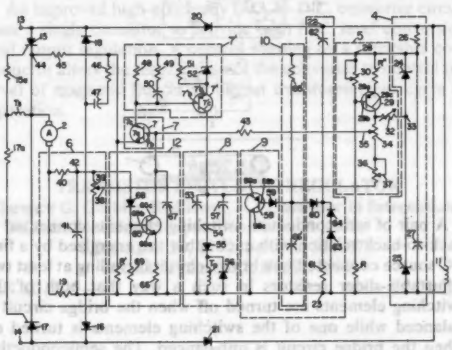
lator and the electrical timing signal during which the corresponding silicon controlled rectifier to be conductive and an extinguishing silicon controlled rectifier NAND gate corresponding to each extinguishing silicon controlled rectifier produces an extinguishing silicon controlled rectifier trigger signal in response to the series of complementary logic level signals of the lowest repetition rate and two of the electrical timing signals. The inverter silicon controlled rectifier trigger signals and the extinguishing silicon controlled rectifier trigger signal produced by each NAND gate are amplified by a respective silicon controlled rectifier trigger signal amplifier circuit and are applied across the inverter silicon controlled rectifiers and the extinguishing silicon controlled rectifiers of a three-phase inverter circuit in the proper sequence to provide for the cyclical energization of the phase windings of a three-phase alternating current motor from a direct current supply potential source.

3,697,844

FULL WAVE DC MOTOR CONTROL

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company

Filed July 28, 1970, Ser. No. 58,773
Int. Cl. H02p *5/06, 7/00*
U.S. Cl. 318—331 **8 Claims**



A motor control circuit for use with a direct current motor. The control circuit includes means for generating and comparing a signal representative of the actual speed of the motor and a reference signal which has a component thereof indicative of the IR voltage of the armature and which further takes into account the field weakening effect of direct current motors to provide complete IR compensation over the entire range of motor speeds.

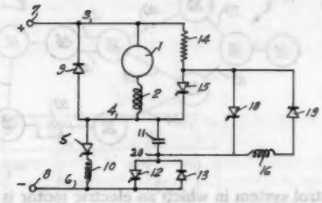
3,697,845

CIRCUIT FOR A DIRECT CURRENT ELECTRIC MOTOR WHICH IS CONTROLLED BY THYRISTORS BOTH WHILE RUNNING AND WHILE BEING BRAKED

Jacques Soffer, Sceaux, and Robert Lhommelet, Bois d'Arcy, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France

Filed Sept. 29, 1970, Ser. No. 76,563
Int. Cl. H02p *5/16*
U.S. Cl. 318—341 **3 Claims**

A circuit for a direct current motor of which the armature is fed, during the driving action of the motor, through the intermediary of a driving thyristor provided with a thyristor extinguishing means, the armature being connected during braking of the motor, through a series connected load resistance and a braking thyristor provided with means for extinguishing the braking thyristor, the extinguishing means comprising a switching inductance and a switching condenser, and a circuit connected in anti-parallel of an extinguishing thyristor and a diode for recharging the switching condenser; the switching condenser has a first terminal connected to a terminal of the motor which is common to the driving thyristor and the braking thyristor, and a second terminal common to the anti-parallel circuit of the means for extinguishing the driving thyristor and to that for extinguishing the braking thyristor, the circuits being so connected that such one switching condenser serves both thyristor extinguishing means.

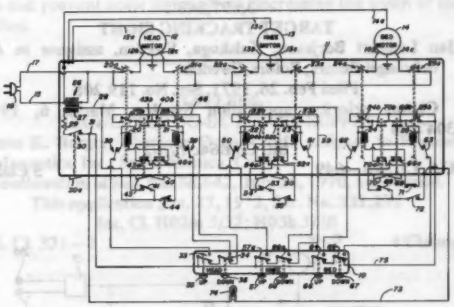


3,697,846

CONTROL SYSTEM FOR HOSPITAL BED

Floyd F. Mueller, Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 11, 1971, Ser. No. 114,590
Int. Cl. H02p *3/00*
U.S. Cl. 318—544 **12 Claims**

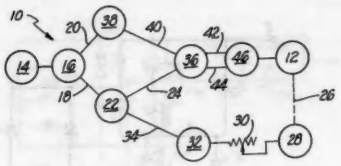


A control system for a hospital bed includes circuitry for selectively energizing an electrical motor for each function desired to be performed. There is a control panel at the footboard of the bed for use by a nurse or other attendant and a pendant for use by the occupant of the bed. There is a forward and reverse position for each motor, and the circuit connections permit independent control at the footboard panel which may be interrupted by action taken at the pendant. Control of functions at the pendant are of the momentary contact type, and it ceases when the occupant releases a switch. Adjustment of the bed at the footboard, however, continues until a limit position is reached or the occupant intervenes or the nurse actuates a stop or cancel switch. The pendant has priority of control, but the nurse may actuate a switch which locks out control by the occupant yet permits the occupant to maintain ability to interrupt control at the footboard. A level sensitive switch is used to place the bed in a predetermined incline to achieve a Trendelenburg position.

3,697,847
SERVOMOTOR CONTROL

Henry V. Rygiol, 3146 Purer Road, Escondido, Calif.

Filed Jan. 27, 1971, Ser. No. 110,020
Int. Cl. G05b 1/01
U.S. Cl. 318—608 6 Claims

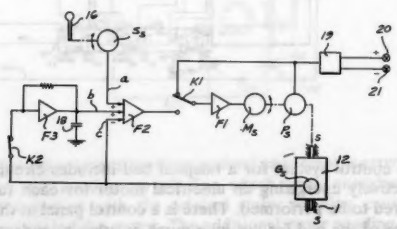


A control system in which an electric motor is operated in either of two directions in order to accomplish a function may be constructed so as to utilize a reference means which supplies a current having pulses at an initial frequency. A splitter means is used to split the reference current into separate currents, each having pulses with related frequencies. The first of these separate currents is supplied to a shifter means together with a control current having pulses at a control frequency which corresponds to a function to be accomplished by the operation of the motor. This shifter means produces an output having pulses at a variable frequency corresponding to when pulses of the first of the separate currents are in synchronism with pulses of the control current. The frequency pulses of the shifter means are compared in the comparison means with the frequency of pulses from within said second separate current to determine if the frequency of one is greater than the other. The motor is connected to the comparison means so as to be operated in either of the noted directions, depending upon which of the frequencies compared is greater.

3,697,848
TARGET TRACKING SIGHT

Jan Lennart Borjeson, Kalskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Feb. 26, 1971, Ser. No. 119,208
Claims priority, application Sweden, March 6, 1970, 3047/70
Int. Cl. B64c 17/02
U.S. Cl. 318—649 5 Claims

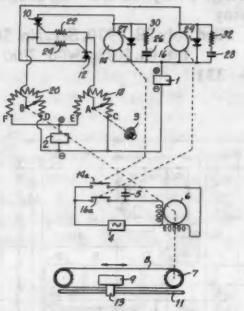


The invention relates to a sighting device, in particular an optical sighting device, for target tracking purposes. The sight comprises a sight casing, which is manually movable by a sight operator in azimuth as well as in elevation, and optical sighting means mounted in said sight casing and having a line of sight which can be deviated in azimuth as well as in elevation relative to the sight casing under the control of the sight operator and which is gyro-stabilized so as to be independent of any movements of the sight casing. During the target catching phase and the rough-aiming of the sight line on the target, however, the gyro-stabilization of the sight line can be suspended and the sight line be locked in a predetermined fixed position relative to the sight casing so as to be movable in space only by rotation of the sight casing. Special features of the sight guarantee that, when said locking of the sight line relative to the sight casing is released and the gyro-stabilization of the sight line is reestablished, the sight line will automatically continue to move in substantially the same direction and with substantially the same angular velocity relative to space as immediately before the transition from a sight line stationarily locked relative to the sight casing to a gyro-stabilized sight line which the sight operator can deviate relative to the sight casing and which is independent of the motions of the sight casing.

3,697,849
ON-OFF SERVOMECHANISM CONTROLLED BY A WHEATSTONE BRIDGE

Michio Uchida, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1971, Ser. No. 106,845
Claims priority, application Japan, Jan. 24, 1970, 45/6490
Int. Cl. G05b 11/14
U.S. Cl. 318—674 4 Claims

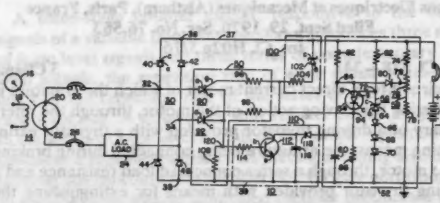


A pair of semiconductive switching elements connected in back-to-back relation with each other are energized by a first DC source connected to a bridge circuit including at least two adjustable-slider resistors in such a way that both of the switching elements are turned off when the bridge circuit is balanced while one of the switching elements is turned on when the bridge circuit is unbalanced. The semiconductive switching elements are connected to relays such that when one switching element is turned on, an object to be controlled is controlled through the relay and the bridge circuit is balanced.

3,697,850
BATTERY CHARGER CONNECTED IN SERIES WITH AN ALTERNATING CURRENT LOAD CIRCUIT VIA A RECTIFIER

Theodore M. Heinrich, Murrysville, Pa.; Robert L. Martin, Excelsior, Minn., and David J. Steele, Harlow, England, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1970, Ser. No. 103,100
Int. Cl. H02j 7/10
U.S. Cl. 320—39 6 Claims



A battery charger which receives energy for replenishing and maintaining a charge on a battery, from an alternating

current source which may vary in voltage and frequency. The battery charger connects the battery in series with the alternating current source and its alternating current load via a rectifier, with the load current being shunted away from the battery when the charging current requirements of the battery are satisfied.

3,697,851

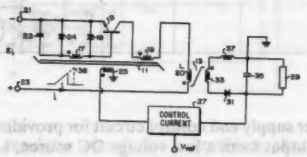
REGULATING CONVERTER CIRCUIT

Robert E. Mast, Woodland Park, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 14, 1970, Ser. No. 97,842

Int. Cl. H02m *3/32*; G05f

U.S. Cl. 321—2 **2 Claims**



An improved high-efficiency D.C.-to-D.C. converter circuit uses a single transistor to provide both D.C. level conversion and output regulation. A control winding on a saturable core inductor alters the recycle time of the converter to control the level of magnetic flux in an output transformer per cycle of operation.

3,697,852

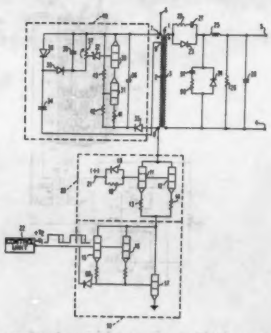
TRANSISTOR SWITCHING REGULATOR

Clarence G. Gerbitz, Red Hook, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 30, 1971, Ser. No. 139,076

Int. Cl. H02m *3/32*; H03k *17/60*

U.S. Cl. 321—2 **10 Claims**



A transistor switching regulator for a power supply including a DC source, a transformer primary, a switching transistor, and a control transistor operated in switching mode connected in series. The switching transistor and control transistor aRe connected in series relationship. The switching transistor has a DC bias connected to its base so that switching is driven into or near saturation when the control transistor is turned on and driven in its open-emitter cut off condition when the control transistor is cut off. The switceing transistor can accept voltage surges induced at turn-off in the transformer primary up to its collector-base breakdown characteristic (BV_{cbo}).

3,697,853

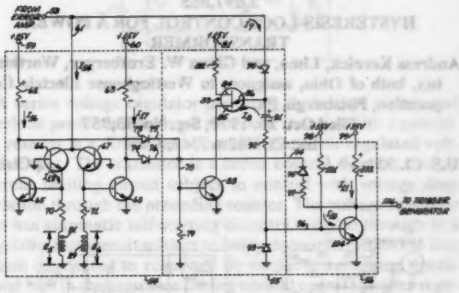
PULSE GENERATOR FOR USE WITH A SWITCHING REGULATOR

John R. Nowell, Phoenix, and Luther L. Genuit, Scottsdale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1971, Ser. No. 214,500

Int. Cl. H02m *1/08, 1/18, 3/32*

U.S. Cl. 321—2 **9 Claims**



A rate generator and a recovery disable circuit receive an input current and deliver pulses having a frequency which is proportional to the value of the current received. The recovery disable circuit prevents the rate generator from delivering pulses during the time the silicon controlled rectifiers and output diodes of the switching regulator are conducting. The rate generator includes an oscillator which develops pulses and a pulse amplifier which amplifies the pulses and prevent noise signals from decreasing the width of the pulses.

3,697,854

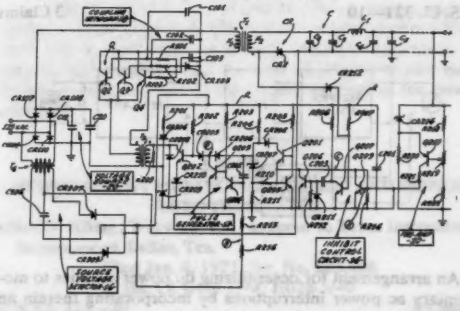
REGULATED DC-DC POWER SUPPLY

James K. Berger, Sherman Oaks, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Continuation of Ser. No. 58,042, July 24, 1970, abandoned. This application Jan. 27, 1972, Ser. No. 221,272

Int. Cl. H02m *3/32*; H03k *3/30*

U.S. Cl. 321—2 **4 Claims**



An improved direct-current power supply is provided for converting alternating-current power or direct-current power

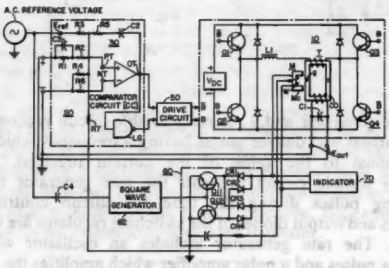
into direct-current power, and which has particular utility in energizing electronic equipment such as computers, data processors, and the like. The power supply of the invention is a regulated fly-back type in which electric energy from an appropriate source is alternately stored in an electromagnetic device, such as a transformer, and then released into a load. The improved power supply of the invention includes control circuitry which causes a constant amount of energy to be stored during each cycle independently of source voltage, and which enables the power supply to exhibit highly favorable regulation characteristics through a wide range of loads.

3,697,855

HYSTERESIS-LOOP CONTROL FOR A POWER TRANSFORMER

Andress Kernick, Lima, and Glenn W. Ernsberger, Worthington, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1970, Ser. No. 83,957
Int. Cl. H02m 7/42; G05f
U.S. Cl. 321—9 A **2 Claims**



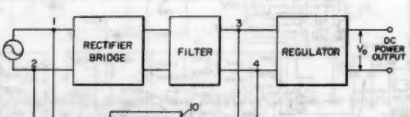
This invention relates to the use of a magnetic sensing device for monitoring the magnetic flux condition in the core of an inverter output transformer as a means for developing an inverter control feedback signal indicative of an unbalance in the magnetic flux between alternate half cycles of an inverter AC output voltage waveform developed across the output transformer.

3,697,856

VOLTAGE REGULATING CIRCUIT

Kwang-ta Huang, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 14, 1970, Ser. No. 97,861
Int. Cl. H02m 1/14, 7/12
U.S. Cl. 321—10 **3 Claims**



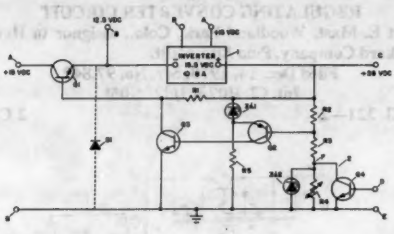
An arrangement for desensitizing dc power supplies to momentary ac power interruptions by incorporating therein an energy-storage network which is charged rapidly to its peak capacity, and then remains on "stand-by" status until an ac power loss occurs. It then supplements the output of the conventional capacitor to maintain steady dc power for a longer period of time than would be otherwise possible.

3,697,857

POWER SUPPLY AND CONTROL CIRCUIT

Mahmound El-Banna, Montreal, Quebec, Canada, assignor to Canadian Marconi Company, Montreal, Quebec, Canada

Filed April 15, 1971, Ser. No. 134,234
Claims priority, application Canada, May 7, 1970, 082190
Int. Cl. H02m ; H04b 1/04
U.S. Cl. 321—20 **3 Claims**



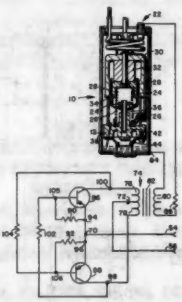
A power supply and control circuit for providing a high voltage DC output from a low voltage DC source, i.e., a DC battery, especially useful for solid state transmitters. The source is connected across the input and a second source is connected between one terminal of the first source and a corresponding terminal of the input, the second source being in series aiding relationship to the first source. A transistor is serially connected between the first source and the second source, and a diode is connected across the first source with one electrode between the transistor and the second source and the other electrode at the second terminal of the first source. The diode provides short circuit protection.

3,697,858

LINEAR SOLENOID AND INVERTER

Robert R. Wells, Anaheim, Calif., assignor to Staco-Switch, Inc.

Filed Oct. 29, 1971, Ser. No. 193,931
Int. Cl. H02m 7/48
U.S. Cl. 321—18 **9 Claims**



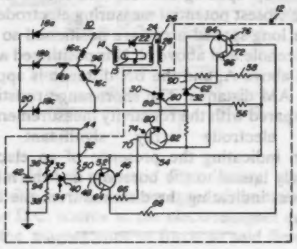
A resistive coupled transistored inverter for use with a solenoid providing a resistor-coupled feedback oscillator effect in an improved form wherein the improvement comprises a governing or control circuit in combination therewith. The governing or control circuit comprises a transistor and an appropriate voltage divider within the entire circuit to govern the periodicity of current oscillations in a uniform manner with respect to the back EMF and mechanical oscillations in the solenoid. The circuit is particularly accurate because it responds to the mechanical oscillations within the solenoid for purposes of matching the electrical current oscillation of the inverter with the natural mechanical oscillations of the moving elements of the solenoid.

3,697,859

VOLTAGE REGULATOR CIRCUIT FOR A BRUSHLESS ALTERNATOR

Raymond E. Nordbrock, Villa Park, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 21, 1971, Ser. No. 145,673
Int. Cl. H02p 9/30
U.S. Cl. 322—28 8 Claims



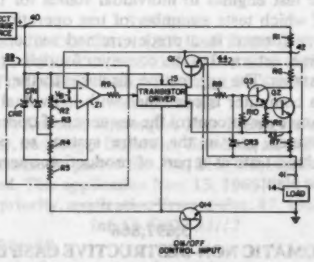
A voltage regulator circuit for a brushless alternator includes voltage responsive circuitry having a zener diode. When the alternator output voltage drops sufficiently, a first transistor, normally in a state of conduction, is turned off to in turn, through a pair of transistors connected thereto, gate on a pair of oppositely poled silicon controlled rectifiers. The silicon controlled rectifiers, which are connected in series with the stationary primary winding of a rotary transformer mounted on the alternator shaft, pass a.c. current to the primary winding. The current flow in the transformer primary induces a current flow in the secondary which is rectified to excite the alternator field. Upon the voltage output of the alternator rising sufficiently to break down the zener diode of the voltage responsive circuitry, the first transistor and the transistors connected thereto are turned on, to gate off the silicon controlled rectifiers, thereby preventing further excitation of the field.

3,697,860

DC STATIC SWITCH CIRCUIT WITH A MAIN SWITCH DEVICE AND A POWER SHARING CIRCUIT PORTION

Donal E. Baker, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 15, 1971, Ser. No. 124,232
Int. Cl. G05f 1/58
U.S. Cl. 323—9 5 Claims



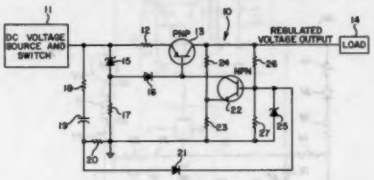
A static switch circuit is provided with a power sharing circuit portion operable to dissipate power in resistive dissipation elements so the required dissipation is shared with the main power transistor in the circuit. The result is a circuit with improved current limiting capability and one that permits use of relatively small and inexpensive transistors. The circuit also includes an improved current limiting controller for the switch.

3,697,861

SHORT CIRCUIT PROTECTED VOLTAGE REGULATOR

Melvin A. Frazier, Marion, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed April 29, 1971, Ser. No. 138,550
Int. Cl. G05f 1/58
U.S. Cl. 323—9 9 Claims



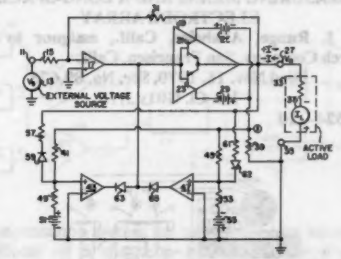
A series voltage regulator providing both short circuit and overload protection having a transistor in series with a preceding resistor in a direct path from dc input to dc regulated voltage output. The transistor is a series control element part of current limiting circuit subject to control with voltage drop variation through the preceding resistor. The voltage regulator also has automatic self-starting circuitry coupled through to a regulator bias circuit subject to being decoupled when the bias circuit connected to regulated dc output is sustaining operational bias in the regulator during normal operation after regulated dc voltage is developed at the regulator output.

3,697,862

POWER SUPPLY HAVING MEANS FOR LIMITING LOAD CURRENTS WITH BOTH ACTIVE AND PASSIVE LOADS

Robert L. Taylor, Green Brook, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 15, 1971, Ser. No. 153,340
Int. Cl. G05f 1/58
U.S. Cl. 323—9 4 Claims



A voltage regulated power amplifier has a bipolar output voltage capability and will drive either a passive or active load. First and second amplifier circuits respond respectively to positive and negative load currents of predetermined magnitudes to limit current at the output terminal of the power amplifier.

3,697,863

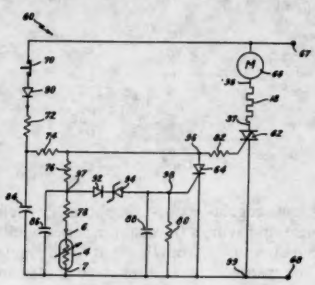
OVERCURRENT PROTECTION SYSTEM AND SENSOR USED THEREWITH

Olive H. Kilner, Warwick, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1971, Ser. No. 103,406
Int. Cl. G05f 1/44; H02p 5/40
U.S. Cl. 323—20 9 Claims

An overcurrent sensor adapted to cooperate with a controller to control the power to a load is shown. In the embodiment illustrated, the controller is an electrical switching means to which the overcurrent sensor furnishes a passive

signal in the form of circuit resistance to cause the controller to operate to decrease or increase electrical power to the load circuit at desired current values. The overcurrent sensor comprises a PTC (Positive Temperature Coefficient) thermistor or an NTC (Negative Temperature Coefficient) thermistor mounted in heat transfer relation, through a layer of electrical insulation, with a first heater which is electrically connected in series with an electrical load, and a heat sink member



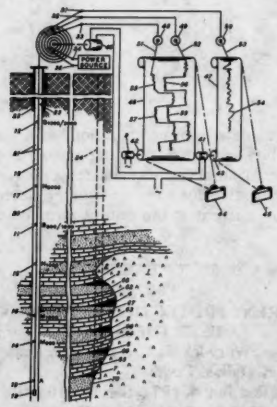
mounted in heat transfer relation through a layer of electrical insulation with the series heater to provide means for changing the transient response time of the thermistor to the series heater current. A second heater is optionally mounted in shunt relation to the first heater to provide a means of increasing the steady state current at which the controller operates, above that obtained solely with the first heater while maintaining approximately unchanged the transient response time of the thermistor assembly for corresponding overload currents.

3,697,864

METHOD OF DETECTING GEOLOGICALLY ANOMALOUS BODIES LATERAL TO A BOREHOLE BY COMPARING ELECTRICAL RESISTIVITY MEASUREMENTS MADE USING SHORT-RANGE MEASURING MEANS AND A LONG-SPACED ELECTRODE ARRAY

Richard J. Runge, Anaheim, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1970, Ser. No. 89,675
Int. Cl. G01v *3/18*
U.S. Cl. 324—10 **6 Claims**



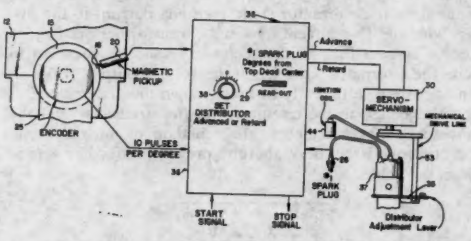
An improved method of detecting geologically anomalous bodies lateral to a borehole and determining the distance thereto utilizes a long-spaced electrode array with a current source and a current sink electrode located within the borehole. A short-spaced electrode array or other short-range electrical resistivity measuring means such as an induction log is used to obtain resistivity values for the formation surrounding the borehole. A long-spaced electrode array comprising two potential measuring electrodes, M and N, and two current electrodes, A and B, positioned within the borehole, is utilized to make resistivity measurements of the formation surrounding the borehole, said measurements reflecting the presence of electrically resistive geologically anomalous bodies located at lateral distances from the borehole up to a distance on the order of twice the spacing between the source or sink electrode and the closest potential measuring electrode. The electrodes of the long-spaced array are positioned so that B lies within the borehole and above N, N is positioned above M, M is positioned above A, and the BN distance is approximately equal to the AM distance. The short-range resistivity values are then compared with the resistivity measurements from the long-spaced electrode array, significant differences therebetween indicating the presence of an electrically resistive anomaly lateral to the borehole and the magnitude of said differences indicating the distance from the borehole to said anomaly.

3,697,865

METHOD AND APPARATUS FOR TESTING ENGINES

Richard L. Smith, Garden City, and Dennis F. Sauerbrey, Southfield, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation of Ser. No. 862,604, Sept. 2, 1969. This application Dec. 15, 1970, Ser. No. 98,475
Int. Cl. F02p *17/00*
U.S. Cl. 324—16 R **3 Claims**



This application discloses a system or installation for testing automobile engines on a production basis to check or reveal the timing angle of each engine and to adjust said angle automatically in the process of the test to a predetermined standard or value. The application discloses further the instrumentation of a single test stand, adapted to perform such function, the manner in which a plurality of individual stands are combined with a conveyor automatically serving such stands to deliver the test engines to individual stands for tests, in the process of which tests a number of test operations are automatically performed in a predetermined sequence with the tested engines returned to the conveyor for delivery to the unloading stations. The application discloses further the manner in which a computer is combined with individual stands and with the conveyor to control the sequence of operations in individual stands and in the entire system to perform the predetermined tests as a part of production operations in an automobile plant.

3,697,866

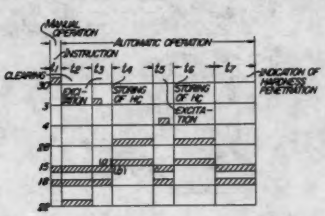
AUTOMATIC NON-DESTRUCTIVE CASE DEPTH MEASURING INSTRUMENT

Kimio Kanda, Hitachi, and Kunio Ono, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1970, Ser. No. 90,997
Claims priority, application Japan, Nov. 21, 1969, 44/92954
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 R **10 Claims**

A testing instrument for automatically non-destructively determining the hardened depth in accordance with the coer-

cive force of a steel by periodically impressing a D.C. magnetic field externally on the steel by energizing an electromagnet from a D.C. source, measuring the magnetic flux density of said D.C. magnetic field by means of a Hall element while varying the magnetomotive force of said field, integrating the



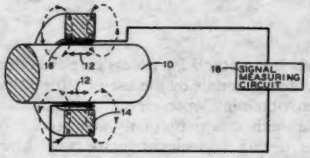
measured value of magnetic flux density, applying the integrated value to the electromagnet alternately with connection of the D.C. source to the electromagnet and reading the value of the magnetomotive force to said field at the point when the magnetic flux density has reached zero or a prescribed value.

3,697,867

VIBRATION SENSOR UTILIZING EDDY CURRENTS INDUCED IN MEMBER VIBRATING IN THE FIELD OF A MAGNET

Claus Kleesattel, Forest Hills, N.Y., assignor to Cavitron Corporation, Long Island City, N.Y.

Filed June 19, 1969, Ser. No. 834,720
Int. Cl. G01r *33/00*
U.S. Cl. 324—40 **19 Claims**



Eddy current devices are used to measure the amplitude and/or direction of various components of a vibrating body as a result of an acoustic signal applied thereto. These devices are also used to measure the power transmitted by said acoustic signal to a load which is coupled to the vibrating body.

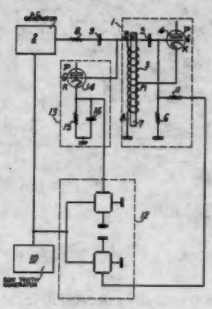
3,697,868

FREQUENCY CONTROLLED HARTLEY OSCILLATOR CIRCUIT FOR NON-DESTRUCTIVE EDDY CURRENT TESTING OF AN ELECTRICALLY CONDUCTIVE MATERIAL

Jean-Claude Carossi, Manosque; Jean-Pierre Dufayet, Aix-en-Provence, and Roger Dujardin, Gambois, all of France

Continuation-in-part of Ser. No. 815,715, April 14, 1969, abandoned. This application Nov. 13, 1969, Ser. No. 876,257
Claims priority, application France, Oct. 17, 1968, 170227
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **4 Claims**

A method of non-destructive eddy-current testing of the characteristics of electrically conductive parts wherein the part to be inspected is introduced inside an induction winding connected at an intermediate point to the electrode which serves as cathode of an active electronic device, said winding being intended to serve both as a coil for generating an alternating magnetic field which produces eddy currents within said part and as a coil for detecting the field induced by said currents, and wherein an alternating-current voltage is applied to said active device and a given type of defect exhibited by said part is detected by studying the resultant changes accord-



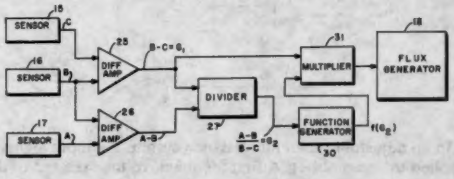
ing to the frequency of said alternating-current voltage in the voltage collected at the electrode which serves as a grid of the active device and/or in the terminal voltage of said winding.

3,697,869

SYSTEM FOR GENERATING COMPENSATING SIGNALS FOR MAGNETIC EFFECTS OF AIRCRAFT ON MAD SYSTEM

Myron M. Greenberg, Warminster, Pa., and Steven A. Macintyre, Reston, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 23, 1970, Ser. No. 74,573
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **4 Claims**



A compensation system for neutralizing an aircraft's magnetic effects on a magnetic anomaly detector system by generating compensating magnetic signals to neutralize the aircraft's magnetic effects on the detector system. Three sets of flux gate sensors or three total field sensors generate electrical signals of a magnitude indicative of a sensed magnetic field. The electrical signals are operated upon to provide compensating signals equal and opposite to an aircraft's magnetic effects on a magnetic anomaly detector.

3,697,870

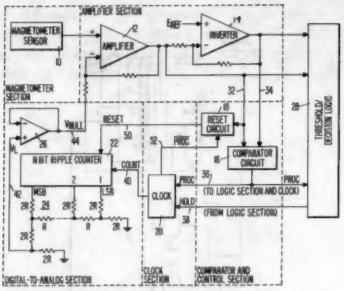
DIGITALLY NULLED MAGNETIC DETECTION SYSTEM

Leonard C. Brenner, Falls Church, Va., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 24, 1971, Ser. No. 183,566
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **8 Claims**

Digital ambient nulling techniques are applied to a magnetometer sensor to provide high sensitivity magnetic detection with minimum circuit and system complexity. The system performs an automatic cancellation of the comparatively large steady-state earth's magnetic field to permit the sensing of

very small magnitude, very low frequency signal information. Such cancellation of the earth's field effects is accomplished



by means of an electronically controlled incremental null voltage.

3,697,871

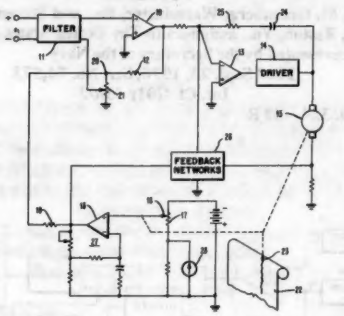
SINGLE ELEMENT ADJUSTMENT FOR SPAN AND GAIN

Samuel J. MacMullan, Newtown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed March 19, 1970, Ser. No. 20,880

Int. Cl. G01r *17/06, 15/08*

U.S. Cl. 324—99 R **9 Claims**



In an adjustable span null balance system the input signal is applied to an amplifier. A first feedback voltage related to the output of the amplifier is summed with a second feedback voltage related to the output of the system. The summed voltages are applied to a single adjustable resistance connected to the input to the amplifier. A change in this adjustable resistance changes both the span of the system and the gain of the amplifier without changing the sensitivity of the system.

3,697,872

CIRCUIT FOR MEASURING THE POWER CONSUMPTION OF THREE PHASE LOADS

Jurgen Schulz, Plochingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

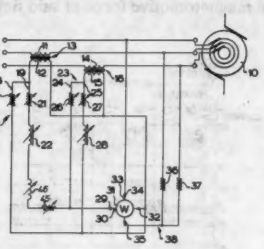
Filed Jan. 28, 1971, Ser. No. 110,417

Claims priority, application Germany, Feb. 3, 1970, P 20 04 685.9

Int. Cl. G01r *7/00, 21/00*

U.S. Cl. 324—142 **13 Claims**

Two of the three phases are connected in series with the primary of a respective current transformer, the secondary of each transformer being connected to a respective current divider that separates the secondary current into an in-phase component and into an out of phase component, the in-phase component of one current divider and the out of phase component of the other current divider being connected to one end of the current path of a watt meter, the other end being connected to the out of phase component of the one current



divider and the in-phase component of the other current divider. The voltage path of the watt meter is connected across the load.

3,697,873

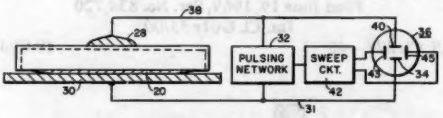
METHOD FOR DETERMINING EXCESS CARRIER LIFETIME IN SEMICONDUCTOR DEVICES

Robert G. Mazur, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1969, Ser. No. 828,621

Int. Cl. G01r *31/22*; B23k *21/00*

U.S. Cl. 324—158 D **1 Claim**



Described is a method for excess carrier lifetime testing of semiconductor materials by the use of ultrasonically soldered contacts in obtaining open-circuit voltage decay measurements. The method is particularly adapted for use in in-line production testing of semiconductor wafers and does not require the use of high temperatures to bond contacts to the wafer being tested.

3,697,874

MULTILEVEL CODE CONVERSION SYSTEM

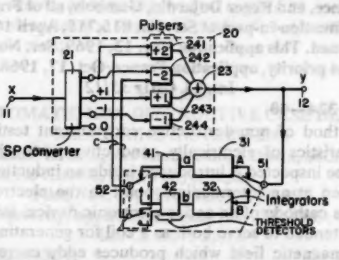
Hisashi Kaneko, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 693,499, Dec. 12, 1967, Pat. No. 3,560,856. This application June 6, 1969, Ser. No. 831,143

Claims priority, application Japan, June 14, 1968, 43/41251; June 14, 1968, 43/41250

Int. Cl. H04l *3/00*

U.S. Cl. 325—38 A **8 Claims**



A PCM code conversion and transmission system in which a code signal representative of an information signal is trans-

mitted in the form of a train of multilevel pulses spaced by a clock pulse interval. A plurality of groups of pulses are extracted from the train at a predetermined interval equal to an integral multiple of the clock pulse interval, the groups having a time lag of one clock pulse interval from one group to another, and each group independently integrated. Means are provided for inverting the polarity of at least one level of the multilevel pulses in response to the time integration in each group to cancel the DC component and eliminate select frequency spectrum components.

3,697,875

LOW FREQUENCY DISTORTION CORRECTION IN ELECTRIC SIGNALING SYSTEMS

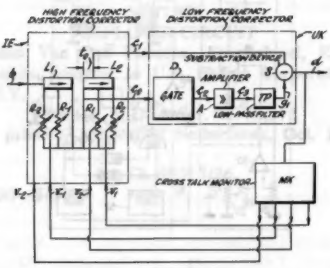
Gustav Guanella, Zurich, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro- Holding AG, Glarus, Switzerland

Filed Aug. 21, 1970, Ser. No. 66,017

Claims priority, application Switzerland, Aug. 29, 1969, 13121/69

Int. Cl. H04l *25/06*

U.S. Cl. 325—65 **14 Claims**



In pulse signal transmission, the low-frequency signal components weakened or suppressed by a distorting transmission channel are transmitted in the form of a series of equi-spaced auxiliary pulses intercalated between successive groups of equal numbers of signal pulses. The distorted auxiliary pulses, which may have a zero, constant or quantized amplitude, are segregated at the receiver from the composite receiving signal and the segregated pulses converted by means of a low-pass filter into a subfrequency correcting signal which is applied to the composite signal in proper time phase and amplitude, to restore the original undistorted pulse signal. Where a continuous signal pulse series is transmitted having a constant pulse spacing distance throughout, special time compression and expansion means serve to compress successive groups of the pulses, to provide spacing intervals for the intercalation of the auxiliary pulses at the transmitter, on the one hand, and to restore the original continuous signal pulse series at the receiver, on the other hand.

3,697,876

ANTENNA SELF-TEST SYSTEMS

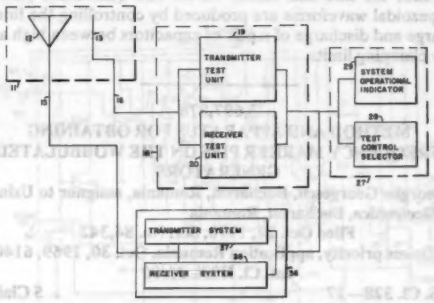
Robert Robbins, Hudson; Arthur R. Whitty, Hollis, and Louis J. Kachavos, Derry, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1969, Ser. No. 867,245

Int. Cl. H04b *1/16, 1/04*

U.S. Cl. 325—67 **4 Claims**

An antenna system is provided, in which a small test probe positioned in the antenna cavity is coupled to a system self-test unit. A signal, designed to exercise the primary functions of the system under evaluation is transmitted between the antenna and the test probe and then conducted to the actual system or the self-test unit for processing. This signal activates the appropriate system which is then evaluated for actual performance.



3,697,877

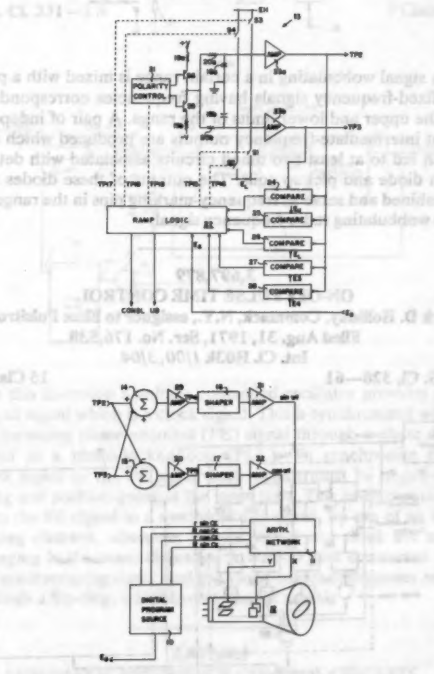
METHODS AND APPARATUS FOR GENERATING ELECTRICAL WAVEFORMS AND QUADRATUREPHASE TRAPEZOIDAL AND/OR SINUSOIDAL WAVEFORMS

James P. Godfrey, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 8, 1971, Ser. No. 113,481

Int. Cl. H03b *19/00*; H03k *5/08*

U.S. Cl. 328—13 **14 Claims**



Conic generator apparatus controlled by a digital program source for tracing conic or eliptical patterns on a cathode ray tube CRT screen. The conic generator responds to a stop signal from the program source to simultaneously produce during a conic trace interval one cycle of a sine and a cosine wave. This is done by first producing a pair of quadrature

phased trapezoidal waveforms. Next, the quadrature phased trapezoidal waveforms are converted to a pair of quadrature phased triangular waveforms which are then shaped to produce the sine and cosine waves. The quadrature phased trapezoidal waveforms are produced by controlling the linear charge and discharge of a pair of capacitors between high and low clamping limits.

3,697,878

METHOD AND APPARATUS FOR OBTAINING FREQUENCY MARKER PIPS ON THE WOBBULATED GENERATORS

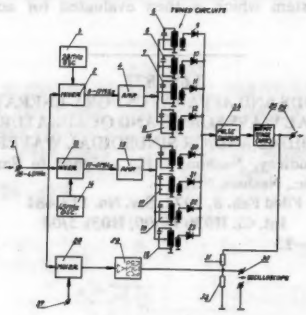
Gheorghe Georgescu, Bucharest, Romania, assignor to Uzinele Electronica, Bucharest, Romania

Filed Oct. 27, 1970, Ser. No. 84,342

Claims priority, application Romania, Oct. 30, 1969, 61407

Int. Cl. H03b *21/00*

U.S. Cl. 328—17 **5 Claims**



A signal wobbulating in a certain range is mixed with a pair of fixed-frequency signals having frequencies corresponding to the upper and lower limits of the range. A pair of independent intermediate-frequency outputs are produced which are each fed to at least two tuned circuits associated with detection diode and pickup coils. The outputs of these diodes are combined and serve as frequency-marking pips in the range of the wobbulating radio-frequency signal.

3,697,879

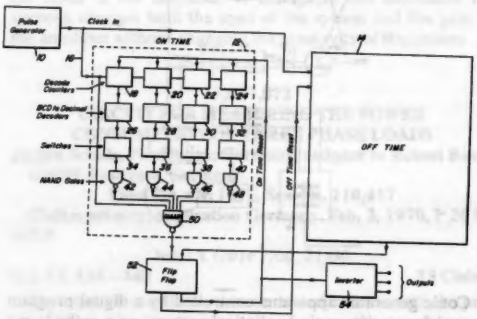
ON-OFF PULSE TIME CONTROL

Jack D. Holliday, Commack, N.Y., assignor to Eltee Pulsitron

Filed Aug. 31, 1971, Ser. No. 176,538

Int. Cl. H03k *1/00, 3/04*

U.S. Cl. 328—61 **15 Claims**



An on-off pulse time control comprising a pulse generator providing a source of time base pulses to on and off timer circuits each of which includes a set of counters for producing a time signal upon completion of a pre-selected time interval. The output of each counter is connected to an inverter gate which provides a logical true signal to a synchronization gate associated with each timer. The outputs of the synchronization gates are applied to a flip flop circuit which resets one timer and simultaneously sets the other timer to initiate its time interval, thus providing a continuous on-off timed cycle.

3,697,880

CIRCUIT FOR SWITCHING BETWEEN TWO UNIDIRECTIONAL VOLTAGES

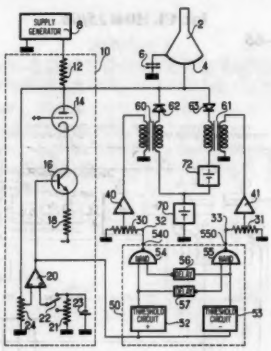
Gerard Melchior, Paris, and Dusan Sinobad, Orsay, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Nov. 23, 1970, Ser. No. 92,115

Claims priority, application France, Nov. 21, 1969, 6940153; April 21, 1970, 7014467

Int. Cl. H04b *1/04*

U.S. Cl. 328—123 **8 Claims**



An apparatus for switching between high and low dc beam acceleration voltages in a dichromatic cathode-ray tube. The acceleration voltage is applied to the screen of the tube which because it is conductive has a capacitance with respect to ground. The apparatus comprises a switchable voltage generator for switching between the high and low voltages, a charging path for charging the capacitance of the screen of the cathode ray tube, and a discharging path for discharging the capacitance of the screen. The apparatus also includes a control circuit for controlling conduction through said charging and discharging paths. The provision of the charging and discharging paths enables rapid switching of the beam acceleration voltage and thereby the color of the tube with the disadvantages of a voltage generator with a low output impedance.

3,697,881

PHASE DETECTION SYSTEM FOR AT LEAST ONE DIGITAL PHASE-MODULATED WAVE

Yukio Nakagome; Kazuo Kawai, both of Tokyo; Hidetaka Yanagidaira, Ohmiya; Sotokichi Shintani, and Hisakichi Michishita, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed July 9, 1970, Ser. No. 53,527

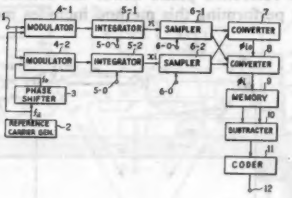
Claims priority, application Japan, July 10, 1969, 44/54094; Sept. 12, 1969, 44/72462

Int. Cl. H04l *27/22*

U.S. Cl. 329—104 **6 Claims**

A phase detection system for at least one digital phase-modulated wave, in which two products of a phase-modulated digital signal and two reference carrier waves each having the same frequency as the phase-modulated digital signal and a phase difference 90° therebetween are at first produced, so that a converted value which is a function of a phase dif-

ference between the phase-modulated digital signal and one of the reference carrier waves is found by integrating respectively the two products or by passing the two products in respective low-pass filters. The phase detection of the phase-modulated wave is performed by comparing the converted value with a reference phase. Compensation means may be further provided to compensate phase error in the converted value.



3,697,882

AMPLIFIER CIRCUIT

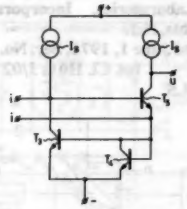
Rudy Johan Van Den Plassche, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,378

Claims priority, application Netherlands, Oct. 13, 1969, 6915477

Int. Cl. H03f 3/26

U.S. Cl. 330—15 **5 Claims**



An amplifier for converting a push-pull signal into a single-ended signal, using a transistor configuration having two input terminals, so that a loss-free conversion is obtained and at the same time both large common-mode signals and large output signals are permissible.

3,697,883

AUTOMATIC GAIN CONTROL CIRCUIT

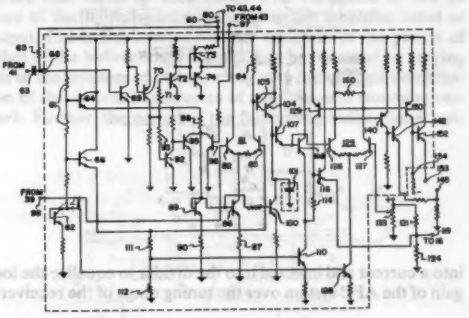
Milton E. Wilcox, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 10, 1970, Ser. No. 71,125

Int. Cl. H03g 3/30

U.S. Cl. 330—29 **12 Claims**

A gated sample and hold IF/RF integrated AGC circuit for a television receiver employs a combination of the synchronizing pulse and a flyback pulse for gating a peak detected video signal during the sync pulse interval to obtain the AGC voltage. A differential amplifier provides RF delay for the RF AGC, with negative feedback from the differential amplifier to the input of the IF AGC amplifier being employed to hold the IF AGC amplifier output constant during a transition period when the RF gain control is varied. Before and after this transition, the IF gain control follows the AGC voltage provided by the gated AGC input circuit.



3,697,884

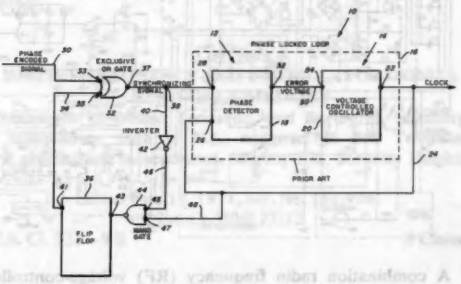
SYNCHRONIZING A PHASE-LOCKED-LOOP FROM PHASE ENCODED SIGNALS

Larry W. Fort, Broken Arrow, and Connie T. Marshall, Muskogee, both of Okla., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed July 16, 1971, Ser. No. 163,208

Int. Cl. H03b 3/04

U.S. Cl. 331—1 A **3 Claims**



In this invention a voltage controlled oscillator provides an output signal which is a clock signal. This is synchronized with the incoming phase-encoded (PE) signal through a phase detector in a phase-locked-loop (PLL). To synchronize the clock signal to the PE signal both signals must be negative-going and positive-going at the same time. This invention corrects the PE signal to a synchronizing signal, by use of an inverting element, whenever the PE signal and clock are not changing in the same direction. A NAND gate connected to the synchronizing signal and the clock senses differences and controls a flip-flop, which inverts the PE signal.

3,697,885

AUTOMATIC FREQUENCY CONTROL CIRCUITS

Jack Avins, Princeton, and Jack Craft, Somerville, both of N.J., assignors to RCA Corporation

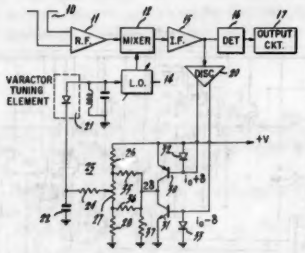
Filed Dec. 4, 1970, Ser. No. 95,082

Int. Cl. H03b 3/04

U.S. Cl. 331—8 **7 Claims**

A circuit used in an automatic frequency control (AFC) scheme employs a voltage divider having a variable arm cou-

pled to a varactor diode to vary the reactance of the diode to enable tuning of a receiver. An AFC error signal is converted



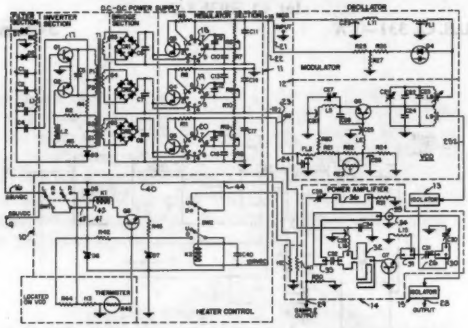
into a current and injected into the divider to equalize the loop gain of the AFC system over the tuning range of the receiver.

3,697,886

SOLID STATE RADIO FREQUENCY VOLTAGE CONTROLLED OSCILLATOR, POWER AMPLIFIER AND DIRECT CURRENT POWER SUPPLY

James B. Conn; J. Richard Delbauve, and Hugh Lilienkamp, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of tthe Navy

Filed Nov. 8, 1971, Ser. No. 196,286
Int. Cl. H03b *1/00*
U.S. Cl. 331—69 **5 Claims**



A combination radio frequency (RF) voltage-controlled oscillator (VCO), RF power amplifier, and direct current (DC) to DC converter power supply all comprised of solid state circuits which generate an RF which is stable in frequency and power over a wide operating temperature range, and which generates DC voltages for use both within the combination and externally to the combination. The VCO has a modulation frequency response of DC to 2 megahertz (MHz) and modulation sensitivity of 1 to 2 MHz per volt D. C.

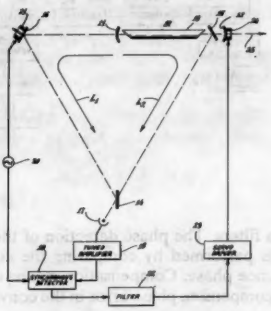
3,697,887

LASER FREQUENCY STABILIZATION SYSTEM AND METHOD

Paul H. Lee, Goleta, Calif., and Michael L. Skolnick, Norwalk, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 23, 1968, Ser. No. 786,178
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **2 Claims**

A method of stabilizing the operating frequency of a laser which includes comparing by means of interference the relative phase of two beams of radiant energy from the laser, one of which is a reference while the other passes through the active lasing material. The optical path traversed by the reference beam is adjusted to produce a selected condition at the point of interference when the laser is oscillating at a frequency which corresponds exactly to an anomaly in the dispersion of the lasing material. Thereafter, the laser frequency is stabilized by adjusting its operating frequency to maintain this condition. Preferably, the comparison is made by varying the reference phase about the selected value. Apparatus for performing this method includes means defining



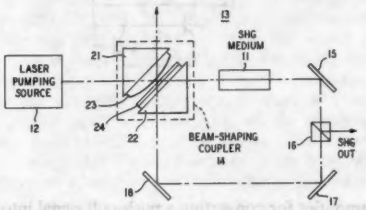
two substantially equal optical paths for radiation emitted by the laser, one of which extends through the active material of the laser. The two paths are terminated at the same point so that interference occurs and the apparatus includes means for detecting the output from the point of interference. Finally, means are provided for controlling the laser frequency to maintain a predetermined interference condition.

3,697,888

EVANESCENT WAVE COUPLING TECHNIQUE FOR BEAM SHAPING

Hans Guenter Danielmeyer, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 1, 1971, Ser. No. 148,739
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **8 Claims**



There is disclosed a coherent optical oscillator in which evanescent wave coupling between two surfaces, at least one of which is curved, provides beam shaping and improved overall conversion efficiency. In general, bicylindrical curvature is provided, for example, by appropriately oriented cylindrical curvatures of the two surfaces. There are specifically disclosed a second-harmonic generator having improved conversion efficiency and a thin-film laser having improved output characteristics.

3,697,889

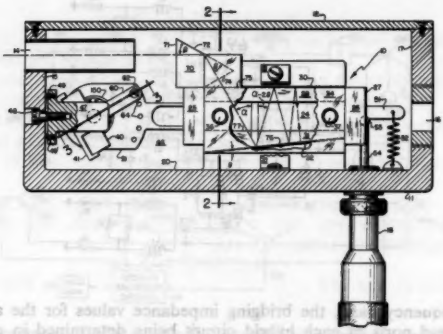
TUNABLE LASER

Clarence Forbes Dewey, Jr., Belmont, Mass., assignor to Xenon Corporation, Medford, Mass.

Filed Feb. 17, 1970, Ser. No. 12,098
Int. Cl. H01s *3/08*; F16h *27/02*
U.S. Cl. 331—94.5 **7 Claims**

A LASER having at one end of the optical cavity a frequency selective reflector that varies the frequency of the light

reflected back into the cavity by rotation. The selective reflector is supported on a first set of bearings and a tuning adjustor for rotating the reflector is supported on a separate bearing. A



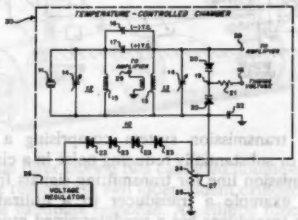
flexible coupling element connects the adjustor and reflector for positive rotational positioning with essentially no load coupled along other axes.

3,697,890

WIDE DEVIATION VOLTAGE CONTROLLED CRYSTAL OSCILLATOR WITH TEMPERATURE COMPENSATION

Daniel J. Healey, III, and Michael M. Driscoll, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 9, 1969, Ser. No. 831,486
Int. Cl. H03b 5/32
U.S. Cl. 331—116 **8 Claims**



A wide deviation voltage controlled oscillator having a tunable crystal filter utilizing a negative temperature coefficient coupling capacitance to produce a linear frequency change with any temperature change and a correcting diode controlled tuning voltage which is also a linear function of temperature to compensate for the linear frequency change and to automatically maintain frequency stability over a wide range of ambient temperatures.

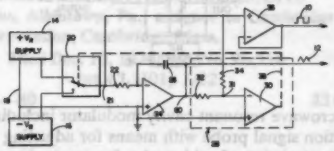
3,697,891

BIDIRECTIONAL WAVEFORM GENERATOR WITH SWITCHABLE INPUT

Ross A. Shade, Santa Ana, and William H. Terbrack, Newport Beach, both of Calif., assignors to J. D. Wrather, Jr.

Filed Dec. 31, 1970, Ser. No. 103,106
Int. Cl. H03c 3/08
U.S. Cl. 332—9 T **12 Claims**

A reactive impedance connected to the input of a feedback amplifier is alternately charged through a switch from a positive and negative voltage reference source. A resistive summing network compares the output of the amplifier with the output of the switch and provides a feedback to toggle the switch back and forth between the two voltage sources. The outputs of both the amplifier and the switch cyclically change polarity to provide a bidirectional output waveform having a period that varies in accordance with variations of one or more of the impedances connected to the amplifier input or output. Either linear or non-linear variation of the period of either of the bidirectional outputs may be obtained by varying one of the resistors of the summing network or some combination of the several impedances of amplifier and summing network. Further, the period of the fluctuating bidirectional output from either the switch or amplifier may be made to undergo a change that is proportional to an analog input signal by providing a third resistive summing network input that is a linear function of an analog input to be modulated upon the output.



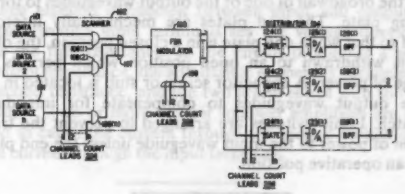
The circuits described are useful in a wide variety of systems and provide a number of different functions. They are particularly useful as time modulators in systems such as those described in a copending application for Data Handling System Employing Time Modulation, Ser. No. 861,785 filed Sept. 29, 1969, by J. P. LaBarber, Ross A. Shade, and William H. Terbrack, and assigned to the assignee of the present application.

3,697,892

DIGITAL FREQUENCY-SHIFT MODULATOR USING A READ-ONLY-MEMORY

Thomas R. Lawrence, Leonardo, and Burton R. Saltzberg, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 19, 1971, Ser. No. 116,998
Int. Cl. H04l 27/12
U.S. Cl. 332—9 R **8 Claims**



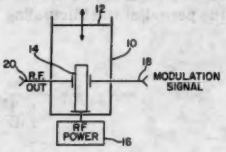
FSK signals in a digital sense are obtained from a memory comprising a table of forty numbers, representing amplitudes of points in one cycle of a sine wave, the points being separated by equal phase angles. A processor reads out, at a fixed rate, the numbers corresponding to each tenth or each eleventh point in accordance with the condition of an incoming binary signal, whereby the output numbers represent a frequency-shift wave. Digital circuitry is used and the modulator may be time shared by a plurality of data sources.

3,697,893

MICROWAVE MODULATOR HAVING INPUT MODULATION SIGNAL PROBE WITH ADJUSTABLE ELECTRICAL CHARACTERISTICS

James L. Faustlin, Plano, and Eliseo Saenz, Garland, both of Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed May 17, 1971, Ser. No. 144,030
Int. Cl. H03c 3/20
U.S. Cl. 332—16 R 6 Claims



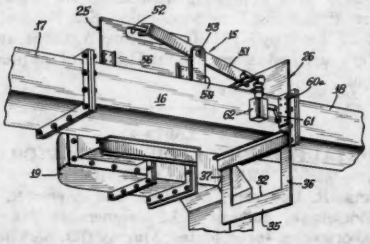
A microwave resonant cavity modulator including an input modulation signal probe with means for adjusting the electrical characteristics of said probe for improving modulation sensitivity and linearity over a relatively wide frequency range.

3,697,894

WAVEGUIDE POWER SWITCH HAVING ALTERNATELY CLOSED SHORTING PLATES

Ray M. Johnson, 118 Verde Mesa, Danville, Calif.

Filed Jan. 29, 1971, Ser. No. 103,361
Int. Cl. H01p 1/10
U.S. Cl. 333—7 7 Claims



An input waveguide and two output waveguides are arranged in an H-plane tee. A power switch determines into which one of the output ports the power will flow. Each of the guides is a rectangular waveguide excited in the TE_{10} mode. The switch includes first and second end plates, each including a shorting tongue adapted to extend through a transverse slot in the broadwall of one of the output waveguides to form a shorting plate. The end plates are mechanically interconnected so that when one plate is in a closed position, the other plate is withdrawn to an open position which permits the passage of power. A capacitor screw or stub is located in one of the output waveguides to compensate for impedance mismatch. Limit switches are arranged to prevent the transmission of power to the input waveguide unless the end plates are in an operative position.

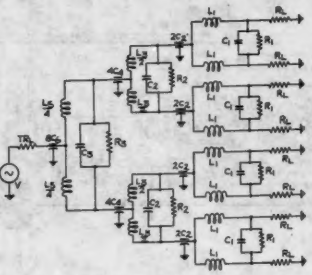
3,697,895

IMPEDANCE TRANSFORMING BINARY HYBRID TREES

Alfred B. Beck, Torrance, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Aug. 3, 1970, Ser. No. 60,324
Int. Cl. H03b 7/38, 7/48; H01p 5/12
U.S. Cl. 333—8 5 Claims

Electrical power dividing or combining, and impedance transforming, binary tree circuits for an optimized output or input port isolation or an optimized VSWR across a predetermined frequency band, or a desired compromise between them, having cascaded tiers of multi-port hybrid circuits with each hybrid circuit having a bridging impedance connected across its arrayed ports. The circuits are derived from an even-mode synthesis of a prototype circuit having equal-ripple input reflection coefficient response across the predetermined frequency band, the bridging impedance values for the arrayed ports of each hybrid circuit being determined in accordance with the desired relationship between VSWR and port isolation by an even and odd-mode analysis of each hybrid circuit.

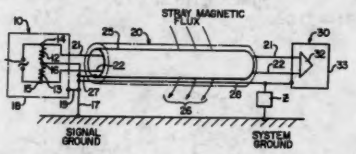


3,697,896

SIGNAL TRANSMISSION SYSTEM

Miklos Sarkozi, Monroeville; Andras I. Szabo, Export, and Perry J. Hite, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1971, Ser. No. 114,621
Int. Cl. H04b 3/28
U.S. Cl. 333—12 9 Claims



A signal transmission system comprising a means for eliminating or substantially reducing noise in a circuit including a transmission line for transmitting signals from a signal source for example a transducer to a utilization circuit, wherein the transducer has a predetermined ground and the transmission line comprises a pair of insulated signal conductors surrounded by a conductive shield with an insulated, shield-current relief conductor extending longitudinally along the signal conductors and parallel thereto outside of the shield and closely adjacent thereto. The shield relief conductor is grounded at one end to the transducer ground and means are provided at the other end for providing a connection to ground either through an intentional actual impedance or a stray impedance at the signal utilization circuit. This impedance may be of various types inherent in the utilization circuit or adapted to suit the utilization circuit.

3,697,897

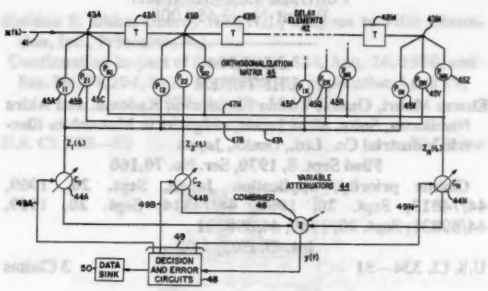
FAST START-UP SYSTEM FOR AUTOMATIC TRANSVERSAL EQUALIZERS

Robert Wu-lin Chang, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 13, 1971, Ser. No. 143,021
Int. Cl. H04b 3/04
U.S. Cl. 333—18 3 Claims

Method and apparatus for rapid initial setting in synchronous data transmission systems of transversal equal-

izer tap coefficients employ a resistive matrix between all delay-line taps and each attenuator to make attenuator input signals mutually orthogonal. The values of the resistive matrix elements are predetermined in accordance with the amplitude



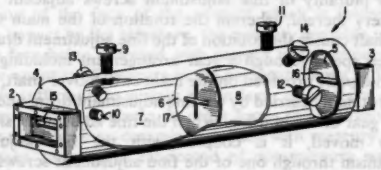
characteristics of the distorting transmission medium and the type of signal processing employed. The effect is to reduce the settling or convergence time for initial equalizer adjustment to two or three signaling intervals even in partial-response signaling systems.

3,697,898

PLURAL CAVITY BANDPASS WAVEGUIDE FILTER

Bruno L. Blachier, Rockville, and Andre R. Champeau, Bethesda, both of Md., assignors to Communications Satellite Corporation

Filed May 8, 1970, Ser. No. 35,869
Int. Cl. H01p *1/16, 7/06*; H03h *13/00*
U.S. Cl. 333—21 A **14 Claims**



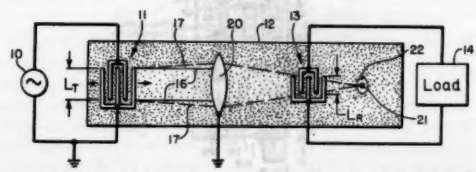
A waveguide filter having two cascaded double-tuned cavities which are resonant in two independent orthogonal modes and provide a bandpass response. An elliptic function is obtained from the bandpass microwave filter structure by using a direct-coupling iris which selectively couples identical resonant modes between adjacent cavities.

3,697,899

ACOUSTIC SURFACE WAVE TRANSMISSION DEVICE

Fleming Dias, Palo Alto, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed April 5, 1971, Ser. No. 131,192
Int. Cl. H03h *7/30*
U.S. Cl. 333—30 **11 Claims**



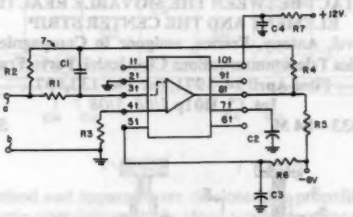
A surface wave integratable filter includes input and output transducers spaced apart on an acoustic wave propagating medium. The input transducer launches acoustic surface waves along a path in which the wavefronts diverge. Disposed on the medium between the input and output transducers is an acoustic lens formed of a material that exhibits an acoustical refractive index greater than one. The lens acts to change the width of the acoustic wavefront and thereby enables appropriate selection of the physical size of the output transducer so as to obtain desired input and output impedances while securing increased efficiency of interaction at the output transducer.

3,697,900

ADMITTANCE INVERSION CIRCUITS

Fred H. Irons, Allentown, Pa., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Dec. 10, 1970, Ser. No. 96,716
Int. Cl. H01p *1/22*
U.S. Cl. 333—80 **23 Claims**



Electronic circuits containing an admittance element produce at a pair of input terminals an equivalent impedance having an admittance term inversely related to the admittance element. The circuits are suitable for miniaturization techniques, and permit electronically simulated inductances of large values to be created with capacitive elements.

The admittance inverting circuits are of two kinds: one produces an equivalent impedance which appears as a resistance paralleling said inverted admittance; the other has an equivalent impedance which appears as a resistance in series with said inverted admittance. Both circuits have the admittance element connected in circuit with first and second resistances and with isolating amplifier means causing one of the parameters of current or voltage in one of said resistances to appear at the circuit's input terminals. In the circuit having a parallel equivalent impedance, the first resistance is in series with the admittance element, and these two are paralleled by said second resistance. An operational amplifier has the admittance element connected between input and output, so that the circuit's input terminals see the voltage developed across the first resistance. In the circuit producing a series equivalent impedance, the admittance element is paralleled by the second resistance, and the two are in series with the first resistance. Two or more emitter follower amplifiers are connected to cause the current through the second resistance to be the current through the input terminals.

3,697,901

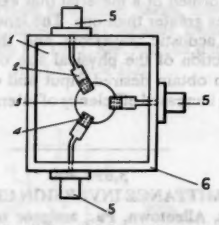
MICROSTRIP CIRCUITS WHEREIN NON-MAGNETIC INSULATING SUBSTRATE AND MAGNETIC INSERT HAVE SAME CRYSTALLINE STRUCTURE

Bernard Chiron; Andre Deschamps, and Louis Duffau, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Dec. 7, 1970, Ser. No. 95,679
Int. Cl. H01p *3/08, 1/32*
U.S. Cl. 333—84 M **3 Claims**

Microwave integrated circuits are designed as microstrip patterns on insulating non magnetic substrates with the same crystalline structure as magnetic materials operating in the

same frequency band. At X band, solid solutions of ferrites with titanates are described and a garnet-like non magnetic



material is preferred at L band. Magnetic parts are set into the substrate.

3,697,902

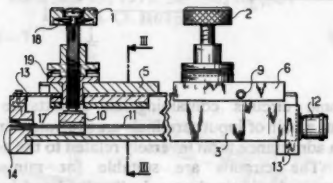
SLOTTED MICROSTRIP LINE FOR IMPEDANCE MATCHING HAVING TWO STOPS TO PREVENT OHMIC CONTACT BETWEEN THE MOVABLE REACTIVE ELEMENT AND THE CENTER STRIP

Guy Louvel, Antony, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed April 14, 1971, Ser. No. 133,937

Int. Cl. H01p *3/08, 5/08*

U.S. Cl. 333—84 M **5 Claims**



Reactor for cancelling the reactances of a circuit by adding to it a conjugate reactance, involving at least one trolley that can be moved along a microstrip and supporting a probe whose penetration can be adjusted by a screw. One of the ends of the microstrip is terminated by a plug specially adapted to receive a transistor electrode.

3,697,903

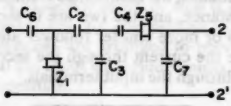
EQUAL-RESONATOR PIEZOELECTRIC LADDER FILTERS

Franz L. Sauerland, Shaker Heights, Ohio, assignor to Clevite Corporation

Filed May 17, 1968, Ser. No. 730,002

Int. Cl. H03h *7/08*

U.S. Cl. 333—72 **10 Claims**



Piezoelectric ladder filters with the following characteristics are described:

a. The filter selectivity may be changed without changing the resonators and without requiring the frequencies of peak insertion loss to be changed. This type of filter will be referred to as "equal-resonator filter."

b. Except for the restrictions on the series resonant frequency of the shunt resonators and the anti-resonant frequency of the series resonators, the remaining resonator parameters are largely, within a range that will be explained, independent of the filter selectivity. This permits use of predetermined resonators for the design of filters with different selectivity characteristics. It includes filters where all the series resonators and all shunt resonators, respectively, are equal, as well as filters in which all the resonators are identical with each other. The latter type will be called "identical resonator" filters.

ERRATUM

For Class 333—31 A; see:
Patent No. 3,698,008

3,697,904

UHF TUNER

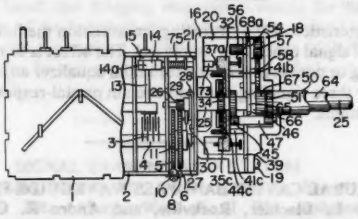
Etsuzo Mohri, Osaka; Toshio Hayakawa, Kadoma, and Akira Nishikawa, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 8, 1970, Ser. No. 70,160

Claims priority, application Japan, Sept. 20, 1969, 44/74813; Sept. 20, 1969, 44/74814; Sept. 20, 1969, 44/89831; Sept. 20, 1969, 44/898321

Int. Cl. H03j *5/02*

U.S. Cl. 334—51 **3 Claims**



A UHF tuner comprising a main channel switch-over shaft, a fine adjustment sleeve slidably and telescopically overlapping the main switch-over and not normally coupled to a fine adjustment mechanism, and a fine adjustment drum accommodated in a housing and slidably mounted on the main switch-over shaft, the fine adjustment drum being provided with a plurality of fine adjustment screws adjacent to the periphery thereof, wherein the rotation of the main switch-over shaft causes the rotation of the fine adjustment drum at a reduced speed through a gear arrangement including a sun gear integrally provided on the main switch-over shaft, planet gears rotatably carried by the fine adjustment drum and an internal gear of the housing. When the fine adjustment sleeve is axially moved, it is coupled with the fine adjustment mechanism through one of the fine adjustment screws and a coupling member associated with said fine adjustment mechanism, thereby enabling fine adjustment by turning the fine adjustment sleeve.

3,697,905

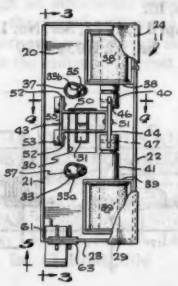
REMOTELY CONTROLLED WALL SWITCH OPERATING MEANS

Jerry Athans, Jr., 6834 Mammoth Avenue, Van Nuys, Calif.

Filed March 9, 1970, Ser. No. 17,627

Int. Cl. H01h *9/00*

U.S. Cl. 335—1 **8 Claims**



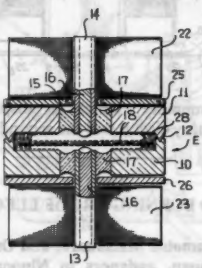
A casing adapted to detachably mount on a wall switch over the cover plate and receive the switch lever having elec-

tromagnetic means for operating the switch lever and switch means at a remote point for controlling the electromagnetic means.

3,697,906
MERCURY SWITCH

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension, Inc., Princeton, N.J.

Continuation-in-part of Ser. Nos. 66,534, Aug. 24, 1970, and Ser. No. 71,294, Sept. 11, 1970. This application April 19, 1970, Ser. No. 134,959
Int. Cl. H01h *1/08*
U.S. Cl. 335—58 **20 Claims**

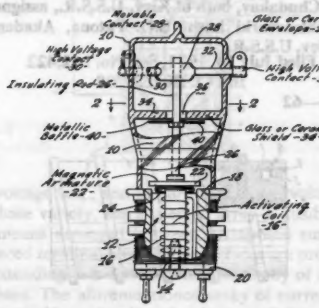


An attitude insensitive mercury relay including a hermetically sealed non-magnetic enclosure composed of a header and header cap, welded together in a high pressure hydrogen atmosphere, including one or more stationary contacts extending insulatedly into the enclosure and a magnetic diaphragm as armature, in the form of a single planar tight spiral having physically separated turns. In one form of the device, the interior of the enclosure and the diaphragm may be mercury wettable, excluding only an insulating feedthrough button as provided for a stationary contact, and also excluding a portion of the face of the contact which is intended to sustain impact by the armature, the mercury wettable portion of that face being indented with respect to the impact area, and the quantity of mercury in the enclosure being sufficient, but only sufficient, to sustain a thin layer of mercury on the mercury wettable surfaces. In other forms the enclosure may be non-metallic, e.g., ceramic, provided with mercury wettable screen surfaces or fabricated of non-mercury wettable material, e.g., magnetic material.

3,697,907
VACUUM RELAY

Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Los Angeles, Calif.

Filed Dec. 31, 1970, Ser. No. 103,153
Int. Cl. H01h *9/32*
U.S. Cl. 335—201 **2 Claims**

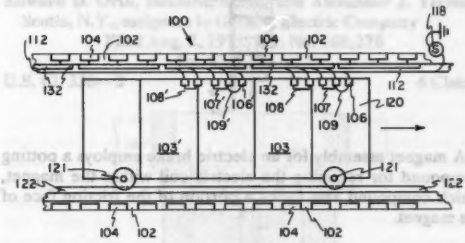


An improved high voltage vacuum relay is provided which includes internal shielding means which serves to prevent ionic discharge within the relay from the high voltage contacts thereof to its grounded magnetic actuating circuit, and which also serves to strengthen the bulb and to make the unit less susceptible to breakage.

3,697,908
FERROMAGNETIC MATERIAL IN A MAGNETIC FIELD AS A PROPULSION SYSTEM

Phillip E. Highsmith, 388 Lake Forest Drive, Spartanburg, S.C.

Filed Dec. 22, 1969, Ser. No. 887,088
Int. Cl. H01f *7/00*
U.S. Cl. 335—209 **12 Claims**

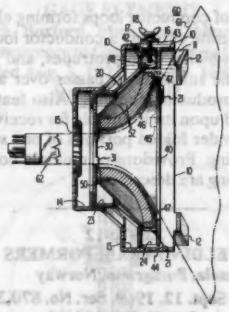


A method and apparatus are disclosed for propelling a ferromagnetic containing vehicle along a predetermined path. A current carrying coil is provided around at least a portion of the predetermined path of travel of the vehicle. A magnetic field is created within the coil which produces a magnetic force on the ferromagnetic material containing vehicle passing therethrough. By continuously moving the magnetic field along the length of the coil, the vehicle responds in movement to the direction of movement of the magnetic field.

3,697,909
DEFLECTION YOKE MOUNT

Edward Walter Christensen, II, Indianapolis, and Ronald Dale EuDaly, Southport, both of Ind., assignors to RCA Corporation

Filed Jan. 15, 1971, Ser. No. 106,778
Int. Cl. H01f *7/00*
U.S. Cl. 335—210 **7 Claims**



A mount for holding a deflection yoke in operating position in relation to a kinescope. An outer housing fixedly mounted on the kinescope provides bearing surfaces for an inner housing which is adapted to being positioned axially and rotatably within. The inner housing contains a holding member into which a yoke is fixedly mounted and which member snaps into the inner housing.

3,697,910

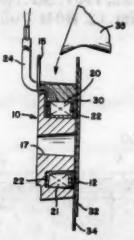
MAGNET ASSEMBLY FOR ELECTRIC BRAKES

Richard G. Tschabrun, Dayton, and Carlos P. Afanador, Centerville, both of Ohio, assignors to The Dayton Steel Foundry Company, Dayton, Ohio

Continuation of Ser. No. 881,413, Dec. 2, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,397

Int. Cl. H01f 7/00

U.S. Cl. 335—296 **4 Claims**



A magnet assembly for an electric brake employs a potting compound for retaining the electric coil within the magnet, which compound also forms a portion of the friction face of the magnet.

3,697,911

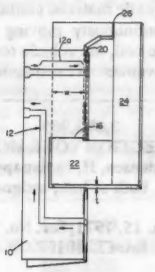
COIL FORM

William A. Strauss, Jr., Darling Hill Road, Mason, N.H.

Filed Jan. 20, 1971, Ser. No. 108,028

Int. Cl. H01f 27/28

U.S. Cl. 336—84 **17 Claims**



Configurations of conductor loops forming electromagnetic coil forms. A substrate carrying a conductor loop has a center opening through which a core protrudes, and while the core remains against the substrate, it passes over and under portions of the coil producing coupling. Also featured is a conductor loop folded upon itself suitable for receiving a core that passes over and under folded portions of one side of the loop to produce coupling. Provisions of multiple coils, convenient terminals and tuning are described.

3,697,912

WELDING TRANSFORMERS

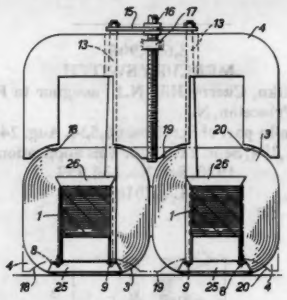
Arne Solli, Frednesoia, Porsgrunn, Norway

Filed Sept. 12, 1969, Ser. No. 870,364

Int. Cl. H01f 21/06

U.S. Cl. 336—133 **8 Claims**

The present invention relates to a welding transformer, of the kind in which each of the coils of the primary and secondary circuits is divided into two parts extending parallel to a magnetic shunt member and so arranged on the two transformer legs that the two coil parts of the primary coil are located on the one side of the shunt member and the two coil parts of the secondary coil on the other side, and wherein the amperage is controlled by means of the substantially M-



shaped shunt member, which is displaceably arranged between the primary circuit and the secondary circuit.

3,697,913

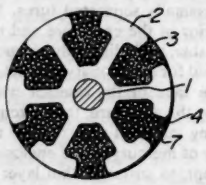
LOADING-AND BURNING-PROOF ELECTROMAGNETIC COIL

Takeshi Imai; Tamotsu Matsubara, and Osamo Takenaka, all of Kariya, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan

Continuation-in-part of Ser. No. 783,762, Dec. 13, 1968, abandoned. This application Jan. 25, 1971, Ser. No. 109,438

Int. Cl. H01f 27/30

U.S. Cl. 336—205 **5 Claims**



A loading- and burning-proof electromagnetic coil used, for example, as rotor and stator windings in which coil of high resistive wire is allowed to cohere with a cohering mixture of an epoxy resin having a molecular weight of above 800 and a curing agent therefor other than acid anhydride type curing agent.

3,697,914

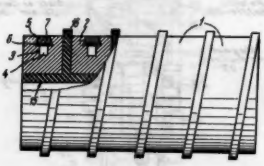
MULTITURN INDUCTOR FOR MAGNETIC-PULSE TREATMENT OF TUBULAR MEMBERS

Konstantin Konstantinovich Khrenov, and Vyacheslav Andreevich Chudakov, both of Kiev, U.S.S.R., assignors to Institut Elektrosvarki imeni E.O. Patona, Akademii Nauk USSR, Kiev, U.S.S.R.

Filed July 14, 1971, Ser. No. 162,422

Int. Cl. H01f 27/08

U.S. Cl. 336—62 **4 Claims**



In the turns of a multiturn inductor for magnetic pulse treatment of tubular members inductor there is provided a channel

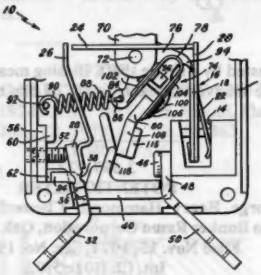
having along its entire length a narrow passage for passing a coolant and a wide portion for placing therein a metal band. Laid on the band is a layer of an elastic sealing material having adhesive properties.

3,697,915

CIRCUIT BREAKER HAVING MEANS FOR INCREASING CURRENT CARRYING CAPACITY

Theodore Brassard, Berkley, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 26, 1970, Ser. No. 83,913
Int. Cl. H01h *71/16, 73/30*
U.S. Cl. 337—74 **12 Claims**



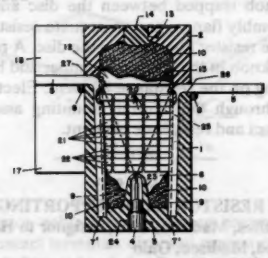
A miniature, trip-free, ambient compensated circuit breaker has improved calibration means and is particularly adapted for high current ratings. A bell crank latch, rotatably carried by manual actuating means, is normally engaged with an ambient-compensated catch for holding stationary and movable contacts in engagement to close a circuit. Current-responsive means is adapted to release the latch from the catch to open the circuit in response to an overload in the circuit. The movable contacts are mounted on a bridge member which in turn is attached to one leg of a U-shaped spring element with the other leg securely attached to the bell crank. In one embodiment, the current responsive means is calibrated by dual adjusting screws and in a second embodiment by a single adjusting screw.

3,697,916

ELECTRIC LOW-VOLTAGE FUSE

Richard A. Belcher, Hampton Falls, and Frederick J. Kozacka, South Hampton, both of N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Aug. 24, 1971, Ser. No. 174,455
Int. Cl. H01h *85/08, 85/12, 85/60*
U.S. Cl. 337—161 **18 Claims**



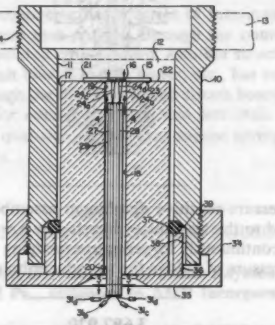
A low-voltage fuse, and in particular a low-voltage fuse of the polyphase variety, has a specific array of fusible current-carrying means arranged between juxtaposed surfaces of a pair of spaced terminal bars. These surfaces are provided with grooves extending in a direction longitudinally of said pair of terminal bars. The aforementioned array of current-carrying means is formed by a plurality of stampings of silver or copper, each including a pair of spaced terminal strips and each further including a plurality of terminal-strip-interconnecting fusible elements in ribbon form. The length of each of said fusible elements of said plurality of stampings exceeds the spacing between said pair of terminal bars. The aforementioned stampings are inserted with the terminal strips thereof into the grooves of said pair of terminal bars in such a way that all constituent fusible elements of each of said plurality of stampings are out of registry with any of the constituent fusible elements of any other of said plurality of stampings. The constituent fusible elements of said stampings are further bent alternately in opposite directions away from the median plane of said pair of terminal bars, thus assuming a substantially C-shaped configuration.

3,697,917

SEMICONDUCTOR STRAIN GAGE PRESSURE TRANSDUCER

Edward D. Orth, Boxford, Mass., and Alexander J. Yerman, Scotia, N.Y., assignors to General Electric Company

Filed Aug. 2, 1971, Ser. No. 168,278
Int. Cl. G01l *1/22*
U.S. Cl. 338—2 **6 Claims**



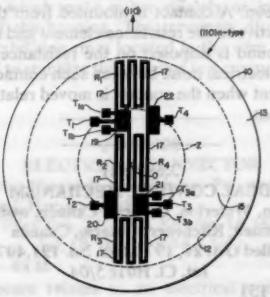
In a pressure transducer of the type utilizing a silicon strain gage diaphragm as a pressure sensor, the diaphragm is bonded to a tubular glass support by an anodic bonding process. Thermally induced stresses and resulting measurement errors are avoided by matching the expansion coefficients of the silicon diaphragm and the glass support. To withstand high operating pressures, the glass diaphragm support is mounted and sealed in the transducer housing so that it is subjected only to compressive forces under operating conditions.

3,697,918

SILICON DIAPHRAGM PRESSURE SENSOR HAVING IMPROVED CONFIGURATION OF INTEGRAL STRAIN GAGE ELEMENTS

Edward D. Orth, Boxford, Mass., and Alexander J. Yerman, Scotia, N.Y., assignors to General Electric Company

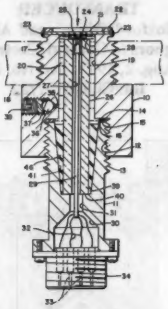
Filed Aug. 3, 1971, Ser. No. 168,548
Int. Cl. G01l *1/22*
U.S. Cl. 338—3 **6 Claims**



A monocrystalline silicon diaphragm pressure sensor has integral strain gage elements in the form of series-connected

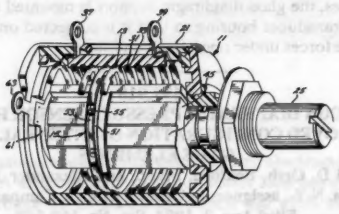
elongated strips arranged parallel to a preselected crystal axis. The configuration results in uniform penetration of the dopant so that the elements are better matched thermally when connected in a Wheatstone bridge type of measuring circuit.

3,697,919
SEMICONDUCTOR PRESSURE TRANSDUCER STRUCTURE
Edward D. Orth, Boxford, and Alvan A. Kessel, Wakefield, both of Mass., assignors to General Electric Company
Filed Aug. 3, 1971, Ser. No. 168,549
Int. Cl. H01c *13/00*
U.S. Cl. 338—42 **6 Claims**



The pressure-sensitive diaphragm assembly is mounted in and sealed to the transducer housing by a wedge-shaped seal which is continuously forced into a wedging and sealing position by pressure of fluid in the transducer housing.

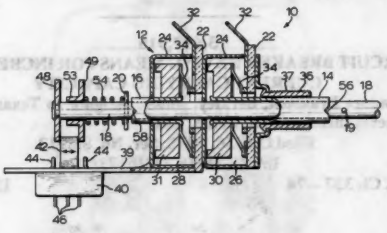
3,697,920
NOISE-FREE ELECTRICAL RESISTOR
Frederick O. Kemp, 701 Echo Street, Anaheim, Calif.
Filed March 11, 1971, Ser. No. 123,230
Int. Cl. H01c *3/00*
U.S. Cl. 338—121 **5 Claims**



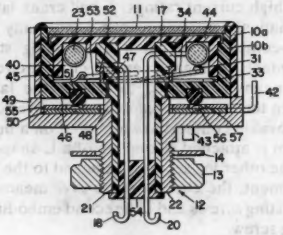
A noise-free electrical device such as a potentiometer which includes a frame having an electrical resistance element mounted thereon. A contact is mounted from the frame for movement relative to the resistance element and an aluminum silicate compound is disposed on the resistance element for reducing the electrical noise between such contact and the resistance element when the contact is moved relative to the resistance element.

3,697,921
DUAL CONTROL MECHANISM
Peter T. Urwin, Waterloo, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed Oct. 21, 1971, Ser. No. 191,407
Int. Cl. H01c *5/04*
U.S. Cl. 338—131 **6 Claims**

An electrical control device is disclosed, in which a push-pull rotatable shaft can be moved longitudinally between two positions, in each of which it engages a different potentiometer control sleeve, so that two potentiometers can be alternatively adjusted by a single shaft. Biasing means are provided to discourage inadvertent adjustment of one of the potentiometers.



3,697,922
POTENTIOMETER
Peter George Henry Hammond, Chesterfield, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Nov. 15, 1971, Ser. No. 198,804
Int. Cl. H01c *5/02*
U.S. Cl. 338—163 **8 Claims**

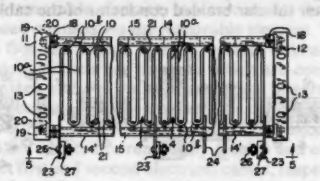


This invention relates to a rotary, manually adjustable, compact potentiometer suitable for panel mounting and which requires a minimum of behind-panel space. The potentiometer comprises a central mounting assembly including a resistor supporting disc and a manually rotatable hollow knob rotatably mounted around the disc so as to form an enclosed resistor chamber. The central mounting assembly further comprising a flange spaced from the disc, an internal flange in the hollow knob trapped between the disc and the central mounting assembly flange, and an arcuate resistance element mounted in the resistor chamber on the disc. A resilient arm is driven by the knob in the resistor chamber and has a movable contact bearing on the resistance element. Electrical conductors extend through the central mounting assembly to the movable contact and resistance element.

3,697,923
RIBBON RESISTOR WITH SUPPORTING MEANS
Milton W. Griffes, Madison, Ohio, assignor to Harvey Hubbell Incorporated, Madison, Ohio
Filed Sept. 13, 1971, Ser. No. 179,975
Int. Cl. H01c *3/00*
U.S. Cl. 338—280 **8 Claims**

A continuous ribbon strip of stainless steel is fan-folded to provide a plurality of equally spaced, parallel uniform linear lengths connected by U-shape folds, and the sole support for the resistor comprises short projections loosely received in openings located along the apices of the U-shape folds with the supporting mechanism including end plates, bolts, supporting insulators and pin projections, providing floating sup-

port of the resistor element for free expansion and contraction. Air flow through the folds for effective convective cooling or forced ventilation is substantially unrestricted by the supporting elements.



3,697,924

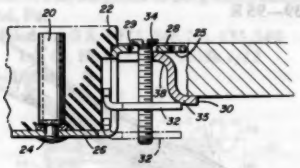
GROUNDING ELECTRICAL DEVICE AND BOX

Michael J. Oliver, 19741 N.W. 7th Court, Miami, Fla.

Filed Nov. 12, 1970, Ser. No. 88,863

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **3 Claims**



A grounding type electrical receptacle which utilizes a positive clamping arrangement between the strap of the receptacle and the grounded metal box to which it is attached by means of a screw-tightened grounding wedge. The box opening in which the receptacle fits has arcuate ends with no protruding ears so that the receptacle can be adjusted to proper vertical or horizontal alignment.

3,697,925

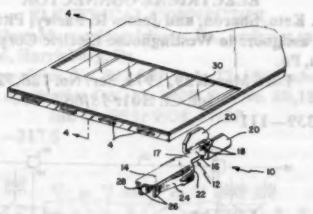
TERMINATION MEANS FOR FLAT CABLE

Homer Ernst Henschen, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 22, 1970, Ser. No. 57,244

Int. Cl. H05k *1/04*

U.S. Cl. 339—17 F **16 Claims**



Flat conductor cable has connecting means on one end comprising contact terminals disposed against one side of the cable with their forward ends in alignment with the end of the cable and with their axes parallel to the conductors. Each terminal is crimped, at its rearward end, through the cable and into electrical engagement with a conductor so that the surface of the cable supports the terminals. Cable end is contained in U-shaped housing having openings in its web to permit entry of complementary terminals. Where cable is shielded on one side, terminals are positioned on the unshielded side and shielding is removed on shielded side from the zone containing the crimped connections.

3,697,926

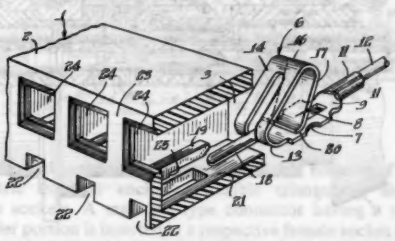
PLURAL CIRCUIT BOARD CONNECTING ARRANGEMENT AND TERMINAL THEREFOR

Kerry M. Krafthefer, Downers Grove, Ill., assignor to Molex Products Company, Downers Grove, Ill.

Filed July 23, 1970, Ser. No. 57,689

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 L **12 Claims**



An electrical connector has a series of terminals each of which has a tongue that projects through the connector for connection to a printed circuit board. Another structure, such as a printed circuit board, switch, wafer, etc., has conductors that project through the first-mentioned circuit board and into said connector for connection with said terminals. The terminals are of the oval-shaped type that impose spring pressure on the conductors.

3,697,927

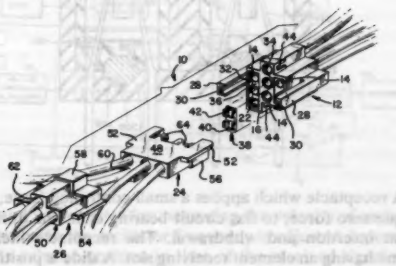
ELECTRICAL CONNECTORS AND HOUSINGS THEREFOR

John Philip Kunkle, Harrisburg, and James Raymond Kunkle, Enola, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 28, 1970, Ser. No. 84,702

Int. Cl. H01r *31/08, 13/64*

U.S. Cl. 339—19 **6 Claims**



Disclosed is a multipart dielectric housing for holding electrical terminals. One half of the housing comprises two or more pieces which mate either singlely or jointly with the other half of the housing. The terminals disclosed include cylindrical stabilizing rings located in the wire barrel portion and designed to stabilize the terminal in a cavity of the housing disclosed.

3,697,928

ELECTRICAL CONNECTOR

Kemper Martel Hammell, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

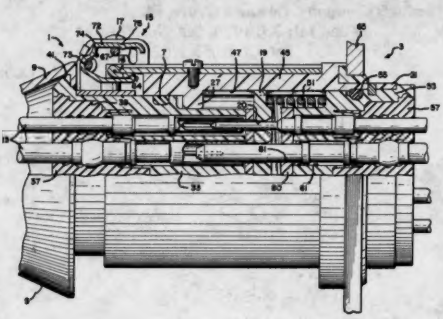
Filed Feb. 27, 1970, Ser. No. 15,167

Int. Cl. H01r *13/54, 13/62*

U.S. Cl. 339—45 M **4 Claims**

The disclosure relates to an electrical connector which comprises mateable housing parts having latching means to latch the housing parts together when they are mated together

in a polarized manner. The latching means is provided with means to maintain the latching means in a positively latched position to maintain housing part latched and a loaded spring



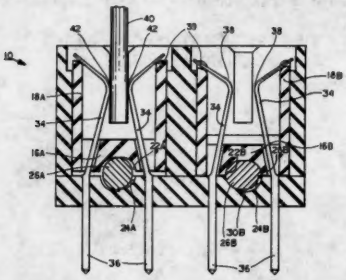
to disengage the members when unlatched. Integral contact retention means are provided in the housing parts to retain the electrical contacts within the housing parts.

3,697,929

CONTROLLED INSERTION FORCE RECEPTACLE FOR FLAT CIRCUIT BEARING ELEMENTS

Joseph E. Konewko, Hillside, and Carl Occhipinti, Melrose Park, both of Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Jan. 18, 1971, Ser. No. 107,103
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 MP **6 Claims**



A receptacle which applies a small controlled force, for example zero force, to flat circuit bearing elements during element insertion and withdrawal. The receptacle includes a frame having an element receiving slot. A slide is positioned in the frame under the slot and is raised by rotating a cam shaft. The slide has projecting fingers which engage the ends of contact fingers to move a point midway along each contact finger further into the element receiving slot thus causing the contact finger to apply increased pressure to an element position in the slot.

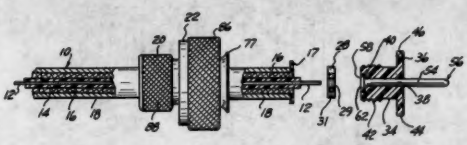
3,697,930

SOLDERLESS COAXIAL CONNECTORS

James W. Shirey, Lakeland, Mich., assignor to John Schroeder, Howell, Mich., a part interest

Continuation-in-part of Ser. No. 769,773, Aug. 28, 1968, Pat. No. 3,573,712. This application July 23, 1970, Ser. No. 57,728
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 C **8 Claims**

Solderless prong and coaxial cable splice connectors for coaxial shielded cables, having a hollow body member provided with a prong or, alternately, with a connecting member contacting the stripped end of the cable inner conductor bent in form of a loop disposed in a transverse plane. The prong, or the connecting member, is electrically insulated from the remaining of the body member which is electrically connected to the outer tubular braided conductor of the cable having its



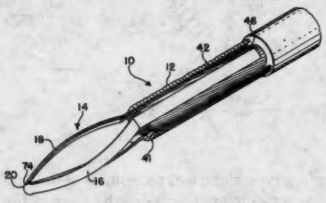
end clamped between a dielectric washer having preferably inner threads for gripping the outer surface of the inner insulation of the coaxial cable and a shoulder portion of the hollow body member.

3,697,931

ELECTRICAL PLUG CONTACT

Kurt Joseph Achten, Granada Hill, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 4, 1971, Ser. No. 103,464
Int. Cl. H01r *11/20, 13/06*
U.S. Cl. 339—95 R **16 Claims**



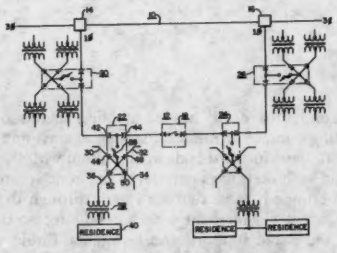
A plug connector element having a plurality of contact arms which are configured to permit the longitudinal edges thereof to abut upon total compression of the plug connector, such as when associated within a complimentary socket element, thus providing a relatively stable connection. The plug connector element is further provided with a sleeve or ferrule portion which is connected to the contact arms as well as to an associated conductor wire in such a manner as to assure penetrating engagement with the conductor wire while maintaining continuous contact between the contact arms and the conductor wire.

3,697,932

ELECTRICAL CONNECTOR

August I. Keto, Sharon, and James R. Farley, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 29, 1971, Ser. No. 128,729
Int. Cl. H01r *13/68*
U.S. Cl. 339—111 **14 Claims**



An electrical connector for connecting a plurality of electrical load circuits to an electrical distribution loop via a removable element, such as a current limiting fuse. The connector includes a housing formed of an insulating resin system, includ-

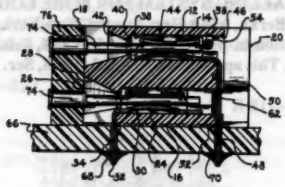
ing a chamber in which the removable element is disposed. First and second spaced contacts are carried by the housing which cooperate with first and second spaced electrodes carried by the removable element, to interconnect the first and second spaced contacts via the removable element. The housing defines first and second integral, tubular outward projections in which contacts are disposed which are connected to the first contact, and a plurality of additional integral, tubular outward projections in which contacts are disposed which are connected to the second contact. The first and second tubular projections are adapted to removably receive and electrically interconnect first and second electrical cables, respectively, in the electrical distribution loop, and the plurality of additional tubular projections are adapted to removably receive electrical cables connected to load circuits. Arc extinguishing members are carried by the housing and by the removable member, to make the assembly and disassembly of the connector load-make and load-break at the contact connected to the electrical distribution loop.

3,697,933

CONNECTOR BLOCK

Richard W. Black, Manchester, and Robert F. Evans, Harrisburg, both of Pa., assignors to Berg Electronics, Inc., New Cumberland, Pa.

Filed April 5, 1971, Ser. No. 131,349
Int. Cl. H01r *23/24*; H05k *1/12*
U.S. Cl. 339—192 R **7 Claims**



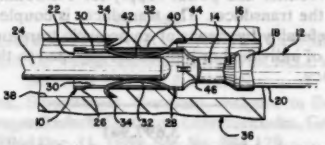
A two row connector block for mounting on a circuit board with two rows of female terminals extending parallel to the circuit board and with a contact tail of each terminal in electrical connection with the circuit board. The terminal cavities in different rows are located one above the other. An insulating spacer is provided to prevent accidental short circuit connections from occurring when contact pins are inserted into the terminals in the row immediately adjacent the circuit board.

3,697,934

ELECTRICAL CONNECTOR

Roydon William Merry, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 802,807, Feb. 27, 1969, abandoned.
This application Oct. 12, 1970, Ser. No. 80,180
Int. Cl. H01r *9/08, 11/22*
U.S. Cl. 339—217 S **7 Claims**



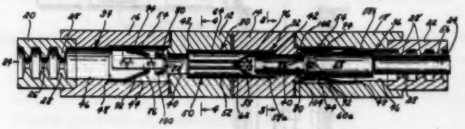
An electrical connector comprising an insulating housing and a contact receptacle disposed within a cavity in the housing. The contact receptacle is provided with a pair of contact arms having hook-like portions at the free ends thereof for retaining the contact receptacle within the housing cavity and for increasing the available contact force between the receptacle and a male pin member.

3,697,935

TERMINAL JUNCTION

William B. Drapkin, Centereach, N.Y., assignor to Kulka Electric Corp., Mount Vernon, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,179
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 S **9 Claims**



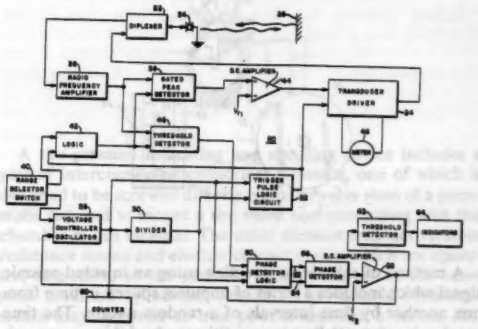
A terminal junction being provided with a housing of rigid dielectric material enclosing flexible triangularly shaped female sockets. A male pin-type connector having a radial shoulder portion is inserted in a respective female socket making electrical contact therewith while end-play movement of the connector is prevented by a spring tang and tab assembly bearing against the front and rear surfaces of the radial shoulder portion when the connector fully engages the socket.

3,697,936

SOUND VELOCIMETER

Ellis M. Zacharias, Jr., Ridgewood, and Uldis Cirulis, Midland Park, both of N.J., assignors to Nusonics, Inc., Paramus, N.J.

Filed Feb. 27, 1970, Ser. No. 15,003
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 E **7 Claims**



A sound velocimeter for measuring the velocity of sound in a fluid wherein the oscillator frequency is adjusted depending upon the relative position in time of the received signal with respect to the transmitted signal.

3,697,937

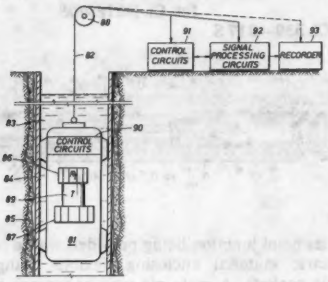
ACOUSTIC REFLECTION COEFFICIENT LOGGING

John D. Ingram, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,179
Int. Cl. G01v *1/22*
U.S. Cl. 340—15.5 A **25 Claims**

An illustrative embodiment of the present invention includes method and apparatus for performing acoustic reflection coefficient logging in a well borehole. An acoustic well logging tool having at least a pair of biradially mounted receivers disposed in a zero spacing configuration and each comprising a plurality of arcuate segments disposed in a one-to-one relationship with each other is moved through the well bore. The electrical outputs of corresponding receiver segment pairs are processed to extract their relative amplitude and phase at a plurality of frequencies over the acoustic spec-

trum. The amplitude and phase data are used to compute the acoustic reflection coefficient exactly at the said plurality of frequencies over the acoustic spectrum thereby providing a frequency spectrum of acoustic reflection coefficients as measured at each of the paired biradially mounted receiver segments at each borehole depth. Such acoustic reflection coefficient spectra may be utilized, among other things, for evaluating cement conditions in the well bore.

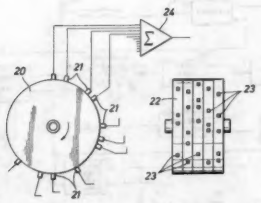


3,697,938

SEISMIC PROSPECTING WITH RANDOM INJECTED SIGNAL

Mehmet Turhan Taner, Houston, Tex., assignor to Seismic Computing Corp., Houston, Tex.

Filed Nov. 7, 1969, Ser. No. 874,867
Int. Cl. G01v *1/22*
U.S. Cl. 340—15.5 TA **9 Claims**



A method of seismic prospecting using an injected seismic signal which includes a series of impulses spaced in time from one another by time intervals of a random nature. The time spacing is substantially non-repetitive and exhibits no ascending, descending or harmonic patterns.

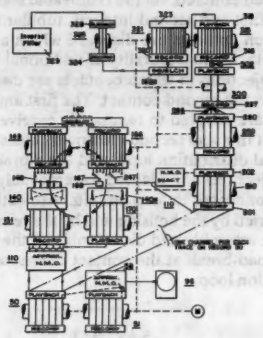
3,697,939

CORRECTIONS FOR SEISMIC DATA OBTAINED FROM EXPANDING-SPREAD

Albert W. Musgrave, Dallas, Tex., assignor to Mobil Oil Corporation

Continuation of Ser. No. 496,735, Sept. 30, 1965, abandoned, which is a continuation of Ser. No. 95,111, March 13, 1961, abandoned. This application Dec. 28, 1970, Ser. No. 101,776
Int. Cl. G01v *1/24*
U.S. Cl. 340—15.5 TD **48 Claims**

Seismic signals from detectors forming split spreads are utilized to correct for weathering, elevation, and the like signals from detectors forming an expanded spread. The signals of the seismic section delineated by the expanded spread have applied thereto time changes under the control of a hyperbolic generator. There are generated as a result of the sweeping across the section and lengthwise thereof of the seismic signals the generation of functions utilized to provide normal moveout corrections of greater precision or accuracy than heretofore. With the normal moveout corrections of greater accuracy applied to the signals of the seismic section, additional corrections are made for dip and thereafter for delineation of the velocity characteristics of the earth along the stratigraphic column. There is included provision not only for identification of primary reflections and multiples but also for the elimination of multiples from the signals of the seismic section. The foregoing operations are carried out in an automatic system which may be either of the analog or digital type.

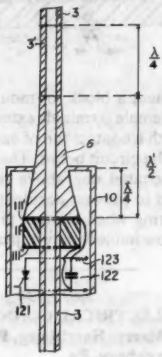


3,697,940

SIGNALLING SYSTEM FOR BORE LOGGING

Bohdan Jiri Berka, 1363 First Avenue, New York, N.Y.

Continuation-in-part of Ser. No. 530,246, Feb. 15, 1966, abandoned. This application Aug. 23, 1968, Ser. No. 755,524
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 R **5 Claims**



A borehole telemetering apparatus comprises a protective casing coaxially mounted to the drill pipe. The casing includes a magnetostrictive or electrostrictive acoustic transducer which is in acoustic contact with the drill pipe, a silicon controlled rectifier and power supply for controlling the activation of the transducer. The transducer is coupled to the drill pipe preferably by means of an acoustic transformer and the lengths of individual drill pipes are adjusted to the transducer frequency.

3,697,941

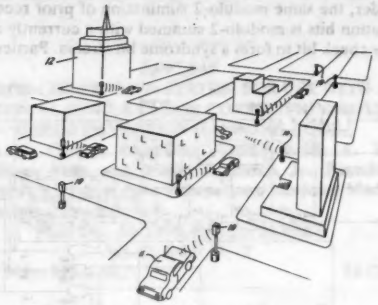
VEHICLE LOCATION SYSTEM AND METHOD

David L. Christ, Bethesda, Md., assignor to Devenco Incorporated

Filed July 1, 1971, Ser. No. 158,748
Int. Cl. G08g *1/12*
U.S. Cl. 340—23 **22 Claims**

Traffic lights in a prescribed area are modulated so that the energy, e.g., visible light, emitted by each light carries a

predetermined code different from the modulating code of every other traffic light. Vehicles moving about the prescribed area carry means for sensing the modulated energy emitted by



each traffic light, and for transmitting to a remote location a signal incorporating the modulation code. At the remote location, the signal is received and converted into a visual display indicating the location corresponding to the received code.

3,697,942

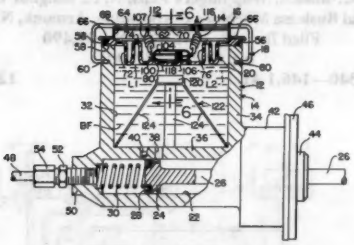
EARLY WARNING BRAKE FAULT DEVICE AND SYSTEM

Loren P. Hocking, East Detroit, and Louis B. Lotti, St. Clair Shores, both of Mich., assignors to Benjamin W. Colman, Huntington Woods, Mich., a part interest

Filed Aug. 19, 1971, Ser. No. 172,990

Int. Cl. B60t *17/22*

U.S. Cl. 340—52 C **21 Claims**



An early warning system in a motor vehicle having a hydraulic brake system to signal potential brake failure due to a loss of brake fluid from the brake system, or to excessive wear of lining on the brake shoes or disc pads at the wheels. The loss is measured as a volume loss of brake fluid, by a magnetically actuated reed switch structure responsive to a control magnet positioned in the brake fluid reservoir at a position below the reed switch to close the same when the brake fluid has reached a predetermined lower level.

3,697,943

INSTALLATION FOR INDICATING THE CLOSING CONDITION OF VEHICLE DOORS, ESPECIALLY OF MOTOR VEHICLE DOORS

Rudolf Andres, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

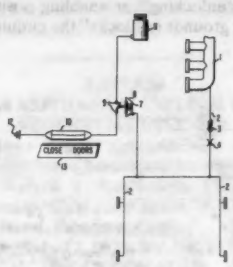
Filed Dec. 11, 1969, Ser. No. 884,129

Claims priority, application Germany, Dec. 12, 1968, P 18 14 233.1

Int. Cl. B60q *1/00*

U.S. Cl. 340—52 D **12 Claims**

An installation for indicating the closing condition of vehicle doors, especially of motor vehicle doors, in which lines are provided that are connected to a vacuum source and terminate within the area of the doors; the lines are in communication with the atmosphere in case a door is not completely closed but are closed with respect to the atmosphere in case



all doors are completely closed; a warning device is provided which in turn is actuated by the pressure in the lines.

3,697,944

VEHICLE TIRE PRESSURE INDICATING AND SIGNALLING DEVICE

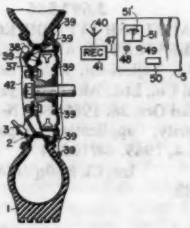
Jisaku Murano, 206, Motohongo-cho, Hachiohji-shi, Japan

Filed Dec. 9, 1969, Ser. No. 883,514

Claims priority, application Japan, Dec. 13, 1968, 43/91431

Int. Cl. B60c *23/04*

U.S. Cl. 340—58 **3 Claims**



A tire pressure indicating and signaling device includes a pair of interconnected cylindrical elements, one of which is designed to be screwed directly on to the valve stem of a pneumatic tire and to mount a tire valve communicating with the chamber in this element. The other element encloses variable resistance means and electric contact means which are operative responsive to the pressure in the chamber of the valve stem mounted cylindrical element. The variable resistance means may comprise an iron powder element, a carbon element, or a pressure-sensitive transistor. A signal transmitter is connected to the variable resistance and to the contact means and may be mounted either directly on the tire or adjacent the tire on a fixed portion of the vehicle, such as an axle. When the transmitter is mounted on the tire, it transmits a radio signal to a receiver in the operator'compartment, and this receiver is connected to indicating and alarm means. When the transmitter is mounted on the fixed part of the vehicle, it is connected by conductors to the alarm and indicating means in the driver's compartment.

3,697,945

LOCK SWITCH AND SECURITY SYSTEM FOR MOTOR VEHICLE ELECTRICAL CIRCUITS

James D. Comber, 2335 South Overlook Drive, Cleveland Heights, Ohio

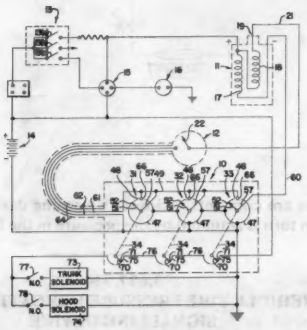
Filed Jan. 20, 1971, Ser. No. 107,987

Int. Cl. B60r *25/04*

U.S. Cl. 340—64 **7 Claims**

A combination type lock switch and security system for a motor vehicle electrical circuit such as the primary ignition circuit. The system utilizes a plurality of switch units mounted in a sealed casing and having control elements that may be ad-

justed to different positions relative to a control panel on one face of the casing. The movable contact of each switch unit has one circuit "unlocking" or enabling position and in all other positions it grounds or "locks" the circuit by engaging a



grounded stationary contact. The system also contemplates the use of a tamper proof conductor between the lock switch casing and another circuit component such as a distributor for the vehicle motor.

3,697,946

SEQUENTIAL FLASH TYPE DIRECTIONAL SIGNAL DEVICE FOR AUTOMOBILES

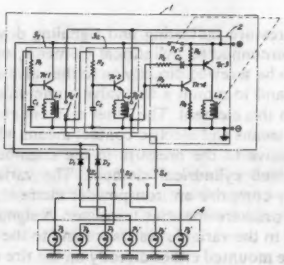
Kenichi Nishioka, Tajimi-shi, Japan, assignor to Imasen Electric Industrial Co., Ltd., Aichi-ken, Japan

Filed Oct. 28, 1969, Ser. No. 871,834

Claims priority, application Japan, Nov. 14, 1968, 43/83492; Feb. 4, 1969, 44/10084

Int. Cl. B60q 1/38

U.S. Cl. 340—82 **3 Claims**



A sequential flash type directional signal device for automobiles, comprising a pair of series of lamps for indicating the direction of a turn to right or left respectively which are so arranged as to be flashed sequentially one after another in either direction, the control system permitting the flashing of lamps by means of simple delay circuits in combination with switching circuits, and the use of such circuits as a hazard warning circuit.

3,697,947

CHARACTER CORRECTING CODING SYSTEM AND METHOD FOR DERIVING THE SAME

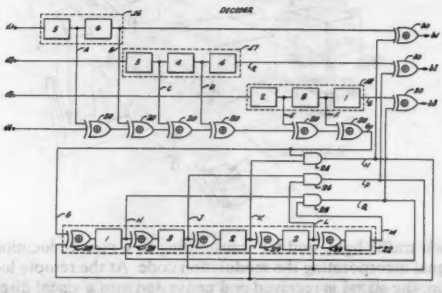
James R. Macy, Newport Beach, Calif., assignor to American Data Systems, Inc., Canoga Park, Calif.

Filed Nov. 16, 1970, Ser. No. 89,871

Int. Cl. G06f 11/12

U.S. Cl. 340—146.1 AQ **7 Claims**

Apparatus and method for utilizing and deriving a self-orthogonal, convolutional character correcting coding system. In an encoder, a parity check bit stream is generated from a modulo-2 summation of two different prior information bits from each of three information bit streams and all four bit streams are transmitted simultaneously. In a receiving decoder, the same modulo-2 summation of prior received information bits is modulo-2 summed with a currently received parity check bit to form a syndrome bit stream. Particular syn-



drome bits along the stream are combined to form three correction bit streams for correcting erroneous bits in each of the three information bit streams. A method for determining code operators, specifying which information bits are to be combined, is described as being suitable for machine implementation and a computer program suitable for implementing the method is disclosed.

3,697,948

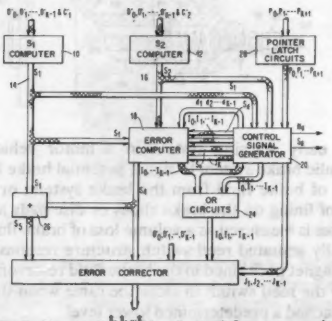
APPARATUS FOR CORRECTING TWO GROUPS OF MULTIPLE ERRORS

Douglas C. Bossen, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,490

Int. Cl. G06f 11/00

U.S. Cl. 340—146.1 AL **12 Claims**



Apparatus including a decoder adapted for recovering the data from a received message corresponding to the sent message but which may be in error wherein the blocks of data consist of k bytes of data (D_0, D_1, D_2,...D_{k-1}) each of b bits. The sent message comprises the k bytes of data plus two check bytes C_1 and C_2, each of b bits. The decoder is effective in recovering the data without error when not more than two of the bytes are in error no matter how many bits may be in error in the two bytes. Pointers are required which indicate the two bytes containing errors. In the absence of the pointers or in the presence of a single false pointer, the decoder is effective in recovering the data without error when not more than a single byte is in error no matter how many bits may be in error in the single byte. The message is encoded by computing the check bytes according to the relationship:

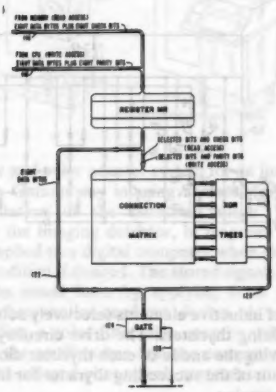
$$C_1 = ID_0 \quad ID_1 \quad \ldots \quad ID_{k-1}$$
$$C_2 = ID_0 \quad T D_1 \quad T^2 D_2 \quad \ldots \quad T^{k-1} D_{k-1}$$

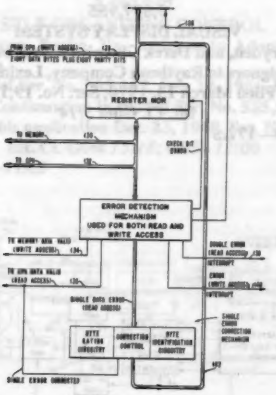
wherein I is the identity element and $T, T^2,\ldots,T^{k-1}$ are distinct non-zero elements of Galois Field (2^b) wherein the indicated multiplication and addition are the Galois Field defined operations, and wherein b is an integer > 1 and k is an integer $2 < k < 2^b$.

3,697,949
ERROR CORRECTION SYSTEM FOR USE WITH A ROTATIONAL SINGLE-ERROR CORRECTION, DOUBLE-ERROR DETECTION HAMMING CODE

William C. Carter, Ridgefield, Conn.; Keith A. Duke, Wappinger Falls, and Donald C. Jessep, Jr., Poundridge, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,262
Int. Cl. G06f 11/12
U.S. Cl. 340—146.1 AL 14 Claims



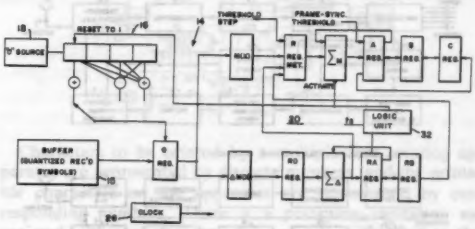

REGISTER MDR
ERROR DETECTION MECHANISM USED FOR BOTH READ AND WRITE ACCESS
BYTE GATING CIRCUITRY
CORRECTION CONTROL
BYTE IDENTIFICATION CIRCUITRY
SINGLE ERROR CORRECTION MECHANISM

The present invention relates to a highly-efficient system for performing single-error correction when utilized with a memory system including a memory equipped with error-detection circuitry for use with rotationally-encoded, single-error correction, double-error detection Hamming coded data wherein said memory system circuitry includes means for developing syndrome bits, the patterns of which indicate faulty operation. Hardware is included for first identifying the specific byte which contains the error and still further hardware is provided to locate the particular bit which is erroneous. By efficient use of the rotational characteristic of the present coding scheme, correction is made only when necessary and only that hardware necessary to correct a single byte is provided in the correction circuitry.

3,697,950
VERSATILE ARITHMETIC UNIT FOR HIGH SPEED SEQUENTIAL DECODER

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Warren A. Lushbaugh, 5139 Princess Anne Road, La Canada, Calif., and James W. Lyland, 2211 East Washington Street, Pasadena, Calif.

Filed Feb. 22, 1971, Ser. No. 117,575
Int. Cl. G06f 11/12
U.S. Cl. 340—146.1 AQ 11 Claims

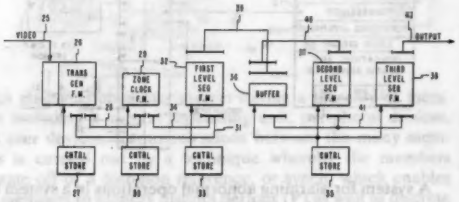


An arithmetic unit for a decoder for data encoded by convolution encoding. The arithmetic unit includes two channels, a main metric channel and a delta metric channel. In the main metric channel a metric is computed for a received symbol branch with respect to check bits from an encoder replica which is fed with a data bit, assumed to be a zero. The delta metric channel computes a delta metric for the same branch. At the end of the computations the sign of the computed delta metric is used to control the changing of the data bit to a one and the adding of the computed delta metric to the metric in the main metric channel.

3,697,951
PATTERN RECOGNITION BY MULTIPLE ASSOCIATIVE TRANSFORMATIONS

Gerald E. Bartholomew; Donald J. Kostuch, both of Rochester, Minn.; Thomas E. Robinson, North Baddesley, England, and William S. Rohland, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1971, Ser. No. 146,763
Claims priority, application Great Britain, May 29, 1970, 25,963/70
Int. Cl. G06k 9/00
U.S. Cl. 340—146.3 Q 15 Claims



An input pattern is assigned to one of a plurality of categories by serial associative transformations of an input data string to an output code. Substrings of the data string derived from the pattern are applied as serial search arguments to an associative store containing transformation codes for particular bit sequences. The transformation codes are then used as

search arguments for an associative store containing tables for producing a second code from particular sequences of the transformation codes. Additional code levels operate similarly to output a pattern-category code. Stored control keys further control the associative-store operations. A zone-clock associative store detects significant transform-code configurations, and records how much of each pattern has been processed.

3,697,952

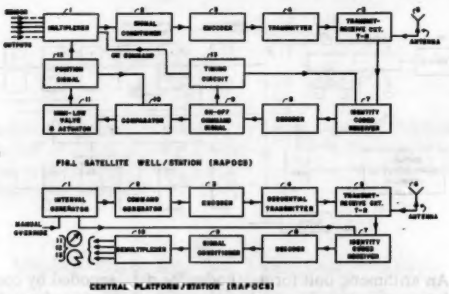
REMOTE ACTUATED POLLUTION AND OIL FLOW CONTROL SYSTEM

Harbhajan Singh Hayre, 10 Legend Lane, Houston, Tex.

Filed June 8, 1970, Ser. No. 44,075

Int. Cl. H04q 7/00

U.S. Cl. 340—147 R **5 Claims**



The position of a high-low valve on oil wells is remotely controlled and monitored from a distant control station in order to either shut the said valve or other associated valves and controls in case of severe environmental oil pollution/emergency conditions, or to open it during otherwise inaccessible periods or to remote control it at all times in order to conserve manpower. Such cases cover possibilities of oil leakage at a well, and failure of the usually provided shutoff valves at the well head.

3,697,953

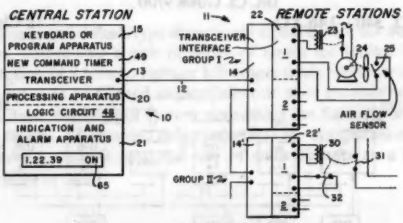
SYSTEM FOR MONITORING ABNORMAL SYSTEM OPERATIONS IN A SYSTEM HAVING A CENTRAL STATION AND A PLURALITY OF REMOTE STATIONS

Frank H. W. Schoenwitz, Schaumburg, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 28, 1970, Ser. No. 101,563

Int. Cl. H04q 9/00

U.S. Cl. 340—163 R **5 Claims**



A system for alarming abnormal operations in a system having a central station and a plurality of remote stations connected by a transmission channel wherein operation of remote equipment is accomplished by sending messages to and from the central station. A logic circuit means is connected to receive outputs of system variables which are used in a prearranged manner to provide an alarm output when the reported condition status doesn't agree with the command intent. To minimize alarm annunciations not all abnormal system conditions will be alarmed, provided the reported status agrees with the command intent. The variables are; the type of commands sent from the central station, how much time has elapsed since the command has been sent, whether the command had actuated equipment at the remote station, whether the operating condition at the remote station had changed status as a result of a change in the equipment, and the present status of the operating condition at the remote station.

3,697,954

MATRIX WITH INDUCTIVE ELEMENTS

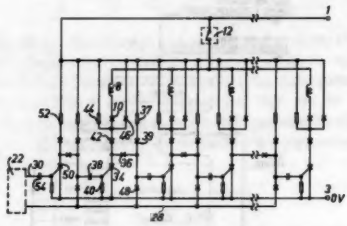
Sven-Erik Maxe, Jakobsberg, Sweden, assignor to Svenska Dataregister AB, Solnar, Sweden

Filed Nov. 9, 1970, Ser. No. 87,724

Claims priority, application Sweden, Nov. 19, 1969, 15580/69

Int. Cl. H04q 9/00

U.S. Cl. 340—166 R **6 Claims**



A matrix of inductive elements selectively actuated by drive circuitry utilizing thyristers. The drive circuitry is a chain of thyristers having the anode of each thyrister diode coupled to the gate circuit of the succeeding thyrister for insuring proper thyrister sequencing.

3,697,955

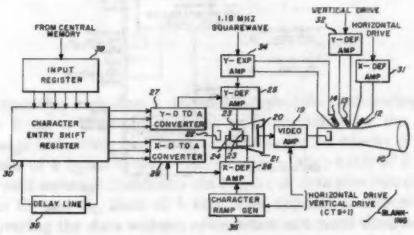
VISUAL DISPLAY SYSTEM

Joseph E. Bryden, and Derek Chambers, both of Framingham, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed March 13, 1970, Ser. No. 19,190

Int. Cl. G06f 3/14

U.S. Cl. 340—172.5 **34 Claims**



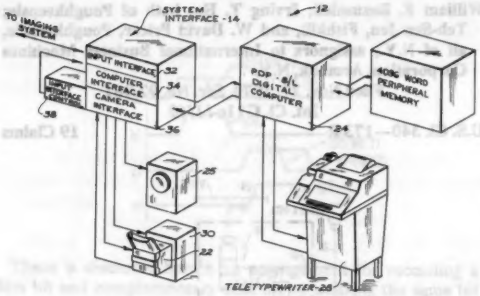
A cathode ray display system in which characters are generated by a monoscope and in which the character address information for the entire raster of a cathode ray tube display is stored in a dynamic memory which is continuously read and regenerated by character entry and read-out logic which controls the monoscope scanning to supply the proper characters to the cathode ray tube as it scans in a raster.

3,697,956

COMPUTER SYSTEM AND COLOR ADAPTER FOR IMAGING DETECTORS AND METHOD OF OPERATION

Samuel C. Goldman, Branford, and Lance M. Albrecht, Wallingford, both of Conn., assignors to Picker Corporation

Filed June 19, 1970, Ser. No. 49,999
Int. Cl. G01d 9/42; G06f 3/14
U.S. Cl. 340—172.5 31 Claims



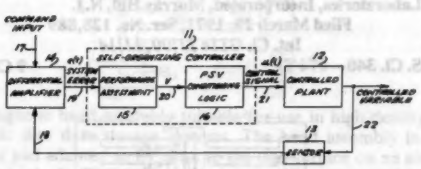
A computer and color adapter system for an imaging detector, such as a Gamma ray imaging camera, for providing a visual presentation of the detected image. The signals developed by the imaging detector, in response to radiation stimuli, are applied to a digital computer when the signals are stored, and modified if desired. The stored signals may then be translated into visual form by applying them to an oscilloscope, or other similar read-out device. A color camera system, including a color filter disc, may by utilized in conjunction with the oscilloscope and the computer in order to provide a multi-colored photograph representative of the detected image.

3,697,957

SELF-ORGANIZING CONTROL

Roger L. Barron, Burke, Va., assignor to Adaptronics, Inc., McLean, Va.

Division of Ser. No. 565,162, July 14, 1966, Pat. No. 3,460,096, Continuation-in-part of Ser. No. 535,551, March 18, 1966. This application Dec. 23, 1968, Ser. No. 785,958
Int. Cl. G06f 15/18; G05b 13/00
U.S. Cl. 340—172.5 26 Claims



BLOCK DIAGRAM - TYPICAL SELF-ORGANIZING CONTROL SYSTEM FOR SINGLE VARIABLE

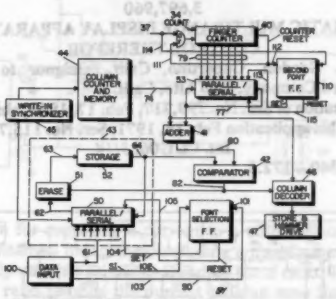
This disclosure relates to a self-organizing control system requiring minimum information storage capable of control of a plant by combining statistical decision theory to determine the true instantaneous plant performance, prediction theory to determine the performance trend, and rapid trial generation to ascertain what must be done to improve the performance trend. This is provided by on-line sampling and changing of system operation. The disclosure also includes performance assessment units and a probability state variable unit as subcombinations for carrying out the control operation.

3,697,958

FONT SELECTING SYSTEM

John J. Larew, Waynesboro, Va., assignor to General Electric Company

Filed Dec. 23, 1969, Ser. No. 887,537
Int. Cl. G06c 11/06
U.S. Cl. 340—172.5 22 Claims



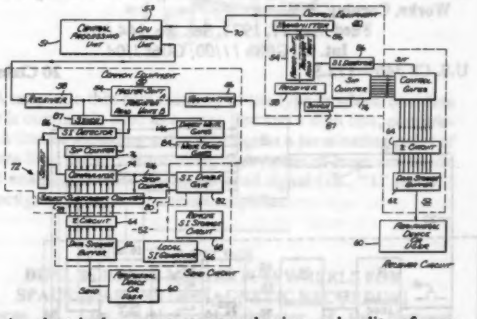
Characters to be printed by a multiple font printing apparatus are represented by discrete numbers, and the printable characters on the apparatus are represented by corresponding numbers. There is a particular indication associated with each font and this indication is added to the printable character number. In order to print characters from particular fonts, means are provided for modifying the input data representing the desired character with said particular indication.

3,697,959

DATA PROCESSING SYSTEM EMPLOYING DISTRIBUTED-CONTROL MULTIPLEXING

Carl N. Abramson, Somerville, and Mark T. Nadir, Warren, both of N.J., assignors to Adaptive Technology, Inc., Piscataway, N.J.

Filed Dec. 31, 1970, Ser. No. 103,191
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 23 Claims



An electrical computer system having a plurality of members including a central processing unit, peripheral devices, and user devices. Communications between the many members is carried out by a technique whereby the members operate off of a common reference, or synch, which enables the members to identify distinct periods (P) as well as discrete consecutive subperiods (SIP) located within a data portion of the periods (P). The SIP identification is accomplished by numbering and counting the SIP to determine the position where it appears in its period (P). The subperiods of SIPs are individually assigned with data meanings (words, commands, letters, numbers, symbols or data of any kind) known to the members of the system. Data is exchanged by inserting, into selected subperiods, signals (SI) identifying the sending

and/or receiving members so that the receiving member may, in response to such signals, derive the data meanings simply by correlating the so-selected subperiods with their assigned data meanings. In this manner, each of the members is individually responsive to data and commands sent to them and participate as a working group with each other and with the central processing unit to perform given programs.

3,697,960

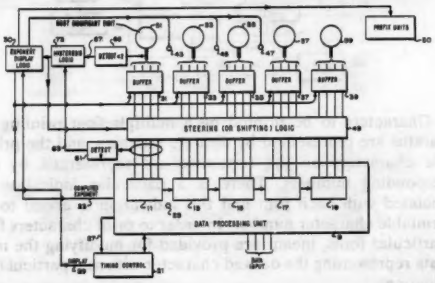
AUTOMATIC MULTIRANGE DISPLAY APPARATUS AND CONTROL THEREFOR

Gary B. Gordon, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 799,717, Feb. 17, 1969, abandoned. This application Feb. 16, 1971, Ser. No. 115,795

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **4 Claims**



Digital data which is arithmetically processed in "floating point" computation is displayed using mantissa and exponent notation. Automatic ranging according to the exponent provides a display which assures optimum resolution, and hysteresis control over the automatic ranging eliminates undesirable range changing on display data which varies only slightly beyond a range limit.

3,697,961

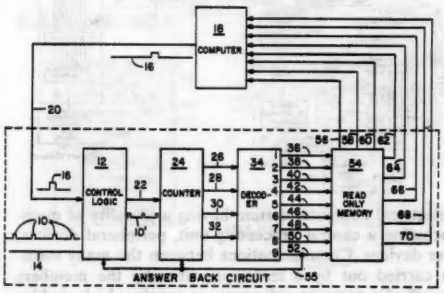
DIGITAL ANSWERBACK CIRCUIT

Howard F. Banks, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed May 17, 1971, Ser. No. 144,062

Int. Cl. G08b *11/00*; G06f *1/04*

U.S. Cl. 340—172.5 **20 Claims**



A digital answerback circuit for providing a computer with information identifying a remote terminal is disclosed. A signal received from the computer initiates operation of the answerback circuit. This signal enables an electronic counter to count clock pulses and produce a binary output which corresponds to the number of clock pulses counted. An electronic decoder then decodes the binary output and produces an output signal on a specific and separate line for each clock pulse received. Each decoder output signal is applied to a separate and specific input of a read only memory which results in a code, preprogrammed for the specific input and contained in the read only memory, being sent back to the computer. These preprogrammed codes contain the necessary identification information and may further contain any other information useful or necessary to the computer.

3,697,962

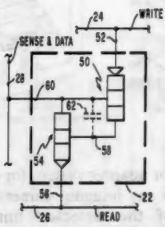
TWO DEVICE MONOLITHIC BIPOLAR MEMORY ARRAY

William F. Beausoleil; Irving T. Ho, both of Poughkeepsie; Teh-Sen Jen, Fishkill, and W. David Pricer, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 27, 1970, Ser. No. 92,961

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **19 Claims**



This specification discloses a stored charged storage cell for implementation in monolithic memories. The storage cells are fabricated in an array form and are connected to accessing means for reading and writing information into and out of the array. An integrated circuit diffused common sensing line is connected to either selected rows or columns for reading and writing. These sensing lines are connected to a switchable current source. The cell itself clamps the output voltage swing and thus reduces power dissipation. The storage cells each comprise a pair of semiconductor elements for storing digital information on an associated parasitic capacitor. The pair of semiconductor devices are interconnected and operated in an AC mode so as to eliminate direct current paths and thus further prevent unnecessary power dissipation.

3,697,963

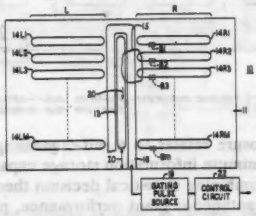
SINGLE WALL DOMAIN MEMORY ORGANIZATION

Donald Eugene Kish, North Plainfield, and James Lanson Smith, Bedminster, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 29, 1971, Ser. No. 128,889

Int. Cl. G11c *21/00*, *11/14*

U.S. Cl. 340—174 TF **9 Claims**



The transfer of single wall domains between propagation channels defined in "field access" arrangements by magnetically soft elements adjacent a layer in which the domains can be moved is achieved by a hybrid arrangement of magnetically soft guide elements and a conductor which effects lateral displacement of domains in pairs between fixed positions defined

by the guide elements consistent with positions which are part of the channels involved in the transfer.

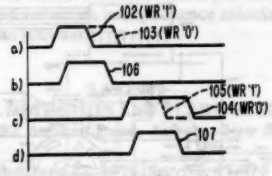
3,697,964

ASSOCIATIVE AND RANDOM ACCESS DEVICE

Woo F. Chow, Berkley Heights, N.J., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 867,435, Oct. 16, 1969, Pat. No. 3,582,915, which is a continuation of Ser. No. 503,363, Oct. 23, 1965, abandoned. This application Sept. 30, 1970, Ser. No. 76,860

U.S. Cl. 340—174 PC 4 Claims



There is disclosed herein an arrangement for recording a data bit and complementary data bit by utilizing the same bit current pulse. The rise time of the bit current pulse is utilized to record the data bit and the fall time of the pulse is used to record the complementary data bit.

3,697,965

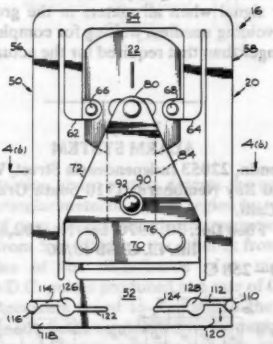
MAGNETIC DISC HEAD ASSEMBLY

Clarence Huetten, Woodland Hills, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 10, 1970, Ser. No. 53,828

Int. Cl. G11b 5/60

U.S. Cl. 340—174.1 E 10 Claims



A magnetic head assembly suitable for use in high density magnetic disc data storage systems. The head assembly includes a pad adapted to fly close to the disc surface on an air bearing having a thickness on the order to 100 microinches. The pad is carried by a spring gimbal which exhibits rotary compliance about perpendicular longitudinal and lateral axes to permit the pad to follow the disc terrain. The spring gimbal comprises an open substantially rectangular frame formed of thin spring stock. The gimbal frame is cantilevered about one of its short sides from a positioner arm mounted for radial movement with respect to a disc surface. The pad is carried by a pair of reverse cantilevered arms forming part of the gimbal frame and extending perpendicularly from the free short side thereof. A pivot bearing is provided to resiliently bear against the pad to urge it toward the disc surface only when the pad is intended to be in flying position.

3,697,966

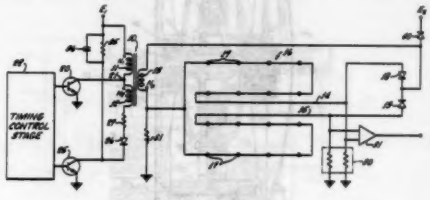
CURRENT DRIVER SYSTEM FOR A CORE MEMORY

George H. Wells, Santa Ana, and Perry B. Persons, Irvine, both of Calif., assignors to Technology Marketing Incorporated, Santa Ana, Calif.

Filed March 25, 1971, Ser. No. 128,030

Int. Cl. G11c 5/02, 11/06

U.S. Cl. 340—174 TB 14 Claims



A system for supplying a current to a core memory stack having substantial inductance including a transformer having a selectively variable primary/secondary turns ratio. The variable turns ratio permits the current buildup time interval in the core state to be minimized while reducing the power required to drive the stack.

3,697,967

MAGNETIC THIN FILM MEMORY

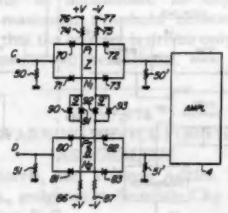
Noriyuki Homma, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed April 12, 1971, Ser. No. 133,124

Claims priority, application Japan, April 13, 1970, 45/30840; Aug. 5, 1970, 45/68468

Int. Cl. G11c 11/14, 5/02

U.S. Cl. 340—174 CA 4 Claims



A magnetic thin film memory of the type in which one data line is commonly used as a sense line and a digit line, comprising a limiter including a diode bridge at a terminating point of a data line, thereby eliminating digit noises of large amplitude and enabling the use of regular read signal (i.e., "1" or "0") directly as the input for a sense amplifier.

3,697,968

DUAL PURPOSE MOMENTUM WHEELS FOR SPACECRAFT WITH MAGNETIC RECORDING

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, Narsingh Deo, 122 Huribut Street, Pasadena, Calif.

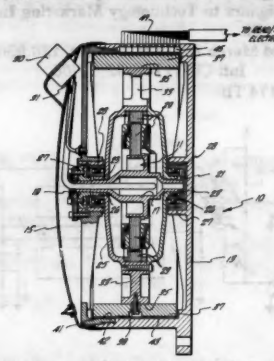
Filed April 16, 1971, Ser. No. 134,571

Int. Cl. G11b 5/82

U.S. Cl. 340—174.1 R 10 Claims

A dual purpose momentum wheel apparatus is disclosed in which a conventional momentum wheel, normally utilized for altitude stabilization of spacecraft, has been modified to function as a memory system for the storage of scientific data. The momentum wheel apparatus comprises a rotary motor mounted within a hermetically sealed drum. A momentum

wheel is mounted on the motor and is adapted to rotate adjacent the interior surface of the drum. The outer periphery of the momentum wheel is coated with a magnetic material,



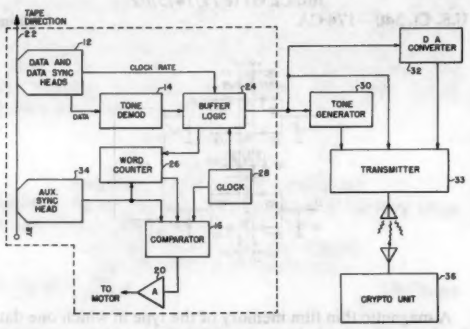
while a plurality of read-write heads are adjustably mounted on the interior of the drum in close proximity to the magnetic periphery of the momentum wheel.

3,697,969

MAGNETIC TAPE WITH PLURAL CLOCKS

Eugene R. Crippa, El Cajon, and Ray B. Lowry, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 29, 1971, Ser. No. 202,815
Int. Cl. G11b *5/44, 27/10*
U.S. Cl. 340—174.1 A **3 Claims**



Tape recorder apparatus compatible in communications systems with cryptographic units which are generally adversely affected by excessive tape jitter and speed variations. Long term, gross tape speed control is provided by a high-compliance, low-mass drive system which follows inversely synchronization (sync) data recorded on the tape. Data tones are demodulated and clocked into an input register at the recorded sync rate. By means of fine dump control, while the input register is accumulating, an outputting register precisely clocks out bits at a rate acceptable to the interface units. The registers are alternately switched from accumulate to dump function.

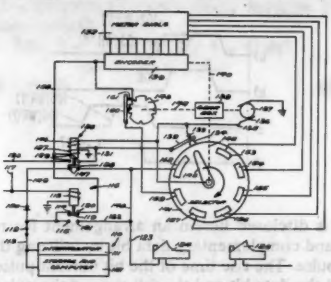
3,697,970

ELECTRICAL METER READING SYSTEM

William W. Jaxheimer, 139 Wall Street, Kingston, N.Y.

Filed June 17, 1970, Ser. No. 46,857
Int. Cl. G08c *15/06*
U.S. Cl. 340—183 **15 Claims**

A telemetering system for sequentially interrogating a plurality of meters and successively transmitting the data thereon to a remote station for suitable processing, such as the sequential reading of meters indicating the consumption of electrical energy, gas, water, and similar meters, and transmitting the readings by encoded electrical signals to a central station or other location where the readings may be recorded and stored for future processing or may be fed directly to a suitable computer for computation, recording, and billing for the service rendered. An encoder provides electrical pulses corresponding to the reading on each meter dial and the dial readings are sequentially encoded and transmitted to the processing station. After all dials of a meter have been read, a coded pulsed identification is transmitted indicating the meter just read. When there is only one meter at a reader location, the reading and information encoding is followed by a transfer signal sent from the meter just completed to the next meter location in



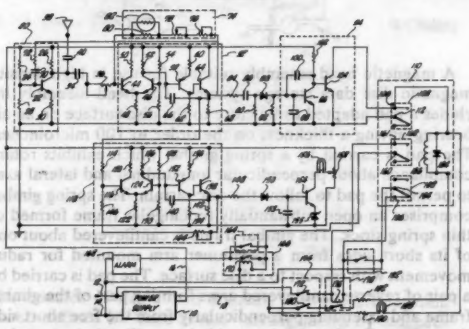
the sequence to energize the reader at this latter meter location. Should this latter meter location be out of operation, the transfer signal is transmitted to the next sequential meter reader until an operative meter is reached. The interrogating, encoding, and transmitting, as previously explained, is then repeated until the entire sequence of meters has been read. When there is a plurality of meters at one location, only one master encoder and one master meter and dial selector are required for all meters at that location, provided the master units are built to read and transmit the number of meters thus grouped together. If the master unit is built to handle more meters than those in the group, provision is made to transmit the transfer signal when all meters in the group have been read, thus avoiding needless waiting for completion of a reading cycle longer than that required for the actual meters in the group.

3,697,971

ALARM SYSTEM

Siegfried Domin, 22053 Independencia Street, Woodland Hills, Calif., and Roy Nembhard, 1710 South Orange Drive, Los Angeles, Calif.

Filed Dec. 30, 1970, Ser. No. 102,818
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 C **13 Claims**



A capacitive alarm system for detecting the presence of an intruder, including an oscillator, a level sensitive switch driven

by the oscillator, an alarm controlled by the switch, and an antenna coupled to the oscillator. Changes in capacitance in the proximity of the antenna vary the level of the oscillator output and, in the presence of an intruder, trigger the switch and alarm. A negative feed-back network, including a light-sensitive variable resistor, is connected to the oscillator. The output of the oscillator also drives a lamp that illuminates the light-sensitive variable resistor. Slowly varying changes in capacitance, due to variations in temperature and humidity, vary the level of the oscillator output and the intensity of the light from the lamp. The variation in intensity of illumination from the lamp directly varies the resistance of the light-sensitive variable resistor so as to maintain the level of the oscillator output constant. The long-time constant of the lamp and the light-sensitive variable resistor circuit prevents compensation for the rapid variations in capacitance associated with the appearance of an intruder.

3,697,972
METAL DETECTION AND ALARM SYSTEMS

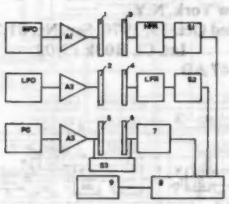
Yull Brown, 182 Auburn Road, Auburn, New South Wales, Australia

Filed June 22, 1970, Ser. No. 47,974

Claims priority, application Australia, June 26, 1969, 57077/69; June 26, 1969, 57078/69; July 11, 1969, 57800/69; Aug. 6, 1969, 59123/69; Dec. 22, 1969, 65563/69; Jan. 12, 1970, PA 0058

Int. Cl. G08b *13/14*

U.S. Cl. 340—258 R **14 Claims**



A metal detection alarm system detects the presence of an article of a particular metal in a given region by measuring the disturbance of two oscillating electromagnetic fields, one oscillating at from 5 to 20 kHz., the other at from 16 Hz. to 5 kHz., and also of the disturbance of a magnetic field established by D.C. pulses produced at a rate of 0 to 16 pulses per second. Receivers tuned to respond to the electromagnetic and magnetic fields established in the region produce a different response when a metal is present, the change in responses depending upon different parameters of the metal article. The outputs from the receivers are compared with the transmitted signals or in a logic circuit with standard signals and if at least two of the receiver outputs indicate the presence of the particular metal, an alarm is actuated. Applied to revolving doors, apparatus to prevent a person carrying a firearm into a bank or other building, or from entering an aircraft, is obtained. The system can also be used in conjunction with conventional non-revolving doors or with windows. A temperature controller utilizing the change of resistance with temperature of a thermistor is also described. The thermistor is located in the base circuit of a transistor which, in turn, is in a control circuit which determines the length of pulses applied to the gates of two thyristors or silicon controlled rectifiers. The time of switching the thyristors or S.C.R.s and length of pulse controls the supply of power to a heater.

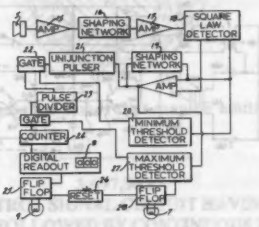
3,697,973
SOUND HAZARD INTEGRATOR

Alan F. Stevens, Oak Creek, and Arnold A. Bergson, Milwaukee, both of Wis., assignors to Quest Electronics Corporation, Milwaukee, Wis.

Filed March 19, 1970, Ser. No. 21,153

Int. Cl. G08b *13/00*

U.S. Cl. 340—261 **15 Claims**



A cumulative sound exposure instrument has an alarm indicator responsive to a selected maximum instantaneous loudness level and has a second indicator which is responsive to a selected value of accumulated exposure. A register provides a continuous reading of the amount of exposure. The instrument integrates a function over time to give a reading that accumulates faster for higher loudness levels. The elements that accomplish these functions include a sound pickup system which applies a signal to a frequency compensating shaping system for shaping the signal output in accordance with an ear's response. An amplitude responsive shaping network receives the signal and applies an output to a pulser in accordance with the function which will be integrated. The pulser output is proportional to the voltage of the input and drives a counter to accumulate an exposure reading. Minimum and maximum threshold detectors control the pulser output so that the counter is driven only when the loudness level lies between two preset limits.

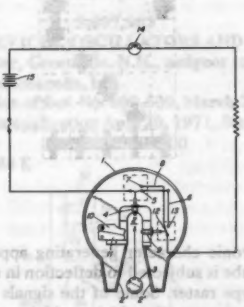
3,697,974
LATCHING WARNING DEVICE FOR FIFTH WHEEL ASSEMBLIES

Julian Taylor Harris, and Thomas Adkins Turner, both of Columbus, Ga., assignors to Fountain City Safety Corporation, Washington, D.C.

Filed Oct. 26, 1970, Ser. No. 83,738

Int. Cl. G08b *23/00*; B62d *53/10*

U.S. Cl. 340—275 **6 Claims**

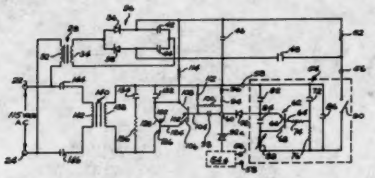


A safety system is provided for fifth wheel assemblies or other trailer connecting devices which includes several switches connected to warning devices which are actuated to warn the operator of improper coupling conditions.

3,697,975
REMOTELY CONTROLLED SWITCHING SYSTEM

Karl Bernstein, Woodland Hills, and E. Richard Walter, Los Angeles, both of Calif., assignors to Safety Signaling, Inc.

Filed Aug. 6, 1969, Ser. No. 856,234
Int. Cl. H04m *11/04*
U.S. Cl. 340—310 12 Claims

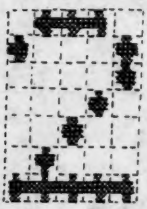


A remotely controlled switching system comprising a transmitter having a power source including the charge on a capacitor thereby to provide a limited duration output signal. As the charge on the capacitor decays, the frequency of the transmitter output signal increases a predetermined amount. The receiver associated with the transmitter includes a tuned circuit which may include a piezo-electric crystal. As the transmitter signal frequency increases due to the discharge of the power supply capacitor, the signal frequency passes through the series resonant frequency as well as the parallel resonant frequency of the crystal. Thus, the receiver need not be fine tuned to a particular frequency to receive the output of a particular oscillator. Moreover, the receiver contains a circuit which prevents stray or transient signals from prematurely triggering its output circuit. The receiver output circuit includes means responsive to limited duration signals which means retains its status until definitely changed.

3,697,976
ELECTRONIC CHARACTER GENERATING

Roger Wakefield Fenton, Essex, England, assignor to The Marconi Company Limited, London, England

Filed Sept. 10, 1970, Ser. No. 71,138
Claims priority, application Great Britain, Sept. 12, 1969, 45,048/69
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A 6 Claims

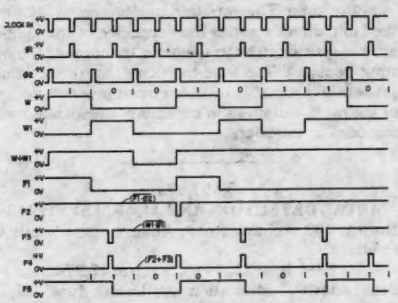


In an electronic character generating apparatus a display cathode ray tube is subjected to deflection in accordance with a television type raster. Some of the signals from a conventional character generating device which are applied to the tube during fixed time durations of successive television line periods so as to produce a character-simulating pattern of rectangular dots, are modified as to their time durations so that the dots of the pattern are modified in shape so as to be non-rectangular or cruciform.

3,697,977
TWO PHASE ENCODER SYSTEM FOR THREE FREQUENCY MODULATION

George H. Sollman, Cambridge, and Samuel J. Dixon, Holliston, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 6, 1970, Ser. No. 52,328
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD 15 Claims

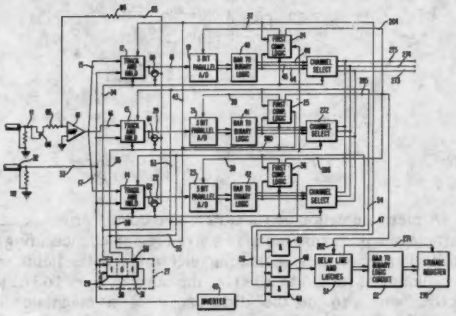


A multiphase encoder translates the bits of a Non-Return-to-Zero digital signal into a three frequency self-clocking having a data transition at the center of a binary ONE bit and a data transition between successive binary ZERO bits.

3,697,978
ANALOG-TO-DIGITAL CONVERTER

Robert S. Prill, West Paterson, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,709
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 14 Claims



An analog signal is held in a capacitor so that the most significant bits of the signal are obtained by parallel conversion and the least significant bits are obtained by a ramp discharge of the capacitor. The converter can convert analog signals having a frequency of 30 MHz by using three channels with each channel having one of the holding capacitors.

3,697,979
DIGITAL ACTUATORS

Wellesley Ashe Kealy, Lymm, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 18, 1971, Ser. No. 107,041
Claims priority, application Great Britain, Jan. 20, 1970, 2,783/70
Int. Cl. G08c *5/00*
U.S. Cl. 340—347 DA 5 Claims

A digital actuator wherein a mechanical displacement of an output member is related to the digital input of a number of

input members which are preferably an array of linked binary units. Loading means are provided urging the input members and the output member to a datum limiting position. An auxiliary transducer is also provided which can override the load-

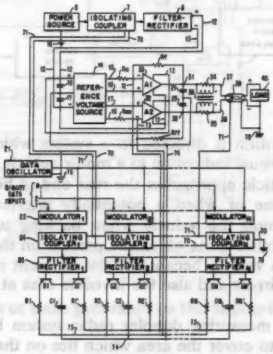
ing means and effect displacement of all the members to a second position in which each individual input member may receive a signal serving to retain it there when the auxiliary transducer ceases to override the loading means.

3,697,980

ISOLATED DIGITAL-TO-ANALOG CONVERTER

Stavros Boinodiris, Boca Raton, and George A. Hellwarth, Deerfield Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,236
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA **10 Claims**



A digital-to-analog converter employing a pair of operational amplifiers connected in a balanced differential configuration to supply an analog output to a two-terminal load. The data and power inputs are isolated from the converter by isolation couplers. Each bit of binary data is sensed at the summing junction of each amplifier by means of a pair of balanced resistors which are switched in accordance with the binary signal. Each set of balanced resistors so sensed is in parallel with the other sets between the summing junctions. The balanced differential configuration enables either terminal at the two-terminal load to be at ground reference potential without deteriorating the common-mode rejection capability of the circuit, thereby eliminating the effect of voltages existing between the ground reference at the load and the ground reference at the binary and power input terminals of the converter.

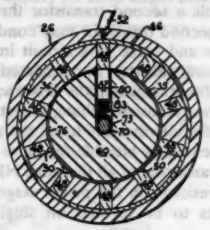
3,697,981

MONITORING ATTACHMENT FOR SELF-SERVICE GASOLINE PUMPS

Chester M. Harkins, 1124 West 11th Avenue, Spokane, Wash., and Delue M. Harkins, 335 Thain, Lewiston, Idaho

Filed Feb. 8, 1971, Ser. No. 113,375
Int. Cl. G08c *1/00*
U.S. Cl. 340—359 **9 Claims**

A monitoring attachment for mounting on self-service gasoline pumps to generate pulses correlated to the amount of gasoline dispensed from the self-service pump. The pulses are transmitted to a remote station as input to a slave register. The monitoring attachment is constructed in a manner to prevent



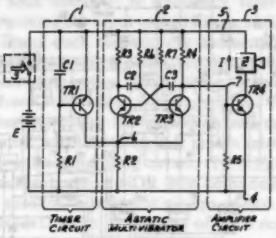
the ignition of gasoline fumes that may be emitted from the pump.

3,697,982

TONE CONTROL SIGNAL CIRCUIT HAVING TONE PULSES FOLLOWED BY CONTINUOUS TONE

Katsumi Kawaki, and Masashi Usui, both of Kawasaki, Japan, assignors to Tokyo Tokei Seizo Kaisha, Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 3, 1970, Ser. No. 94,825
Claims priority, application Japan, June 10, 1970, 45/49514
Int. Cl. G08b *3/00*; G10k *7/00*
U.S. Cl. 340—384 E **4 Claims**



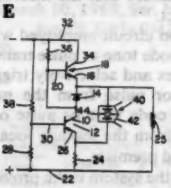
A control signal generator circuit for an annunciator such as an electric tone in the form of a buzzer or bell consisting of three principle circuits: a timer circuit; a multivibrator; and an amplifier circuit. These circuits are connected across a single power supply. The multivibrator provides the function of producing a series of pulses to the amplifier circuit for causing the annunciator to operate on an intermittent basis. The timer circuit provides the function of converting the operation of the annunciator from producing an intermittent audio signal to a continuous audio signal after a predetermined period of time.

3,697,983

ALERTING DEVICES, OSCILLATORS AND FLIP FLOPS

Bronson M. Potter, Greenville, N.H., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 809,539, March 24, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,640
Int. Cl. G08b *3/00*
U.S. Cl. 340—384 E **11 Claims**



Sonic alerting devices of the type controlled by natural frequency of the transducer have efficient drives and can omit capacitors by employing two transistors connected in series

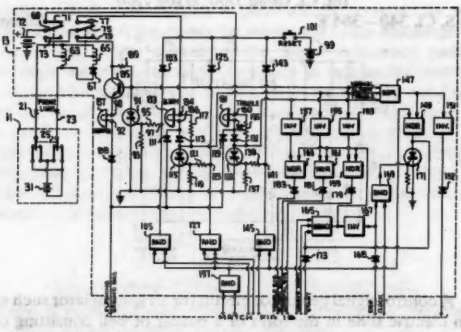
configuration with transducer operation in the series resonant mode. In asymmetrical Circuits a first transistor in its energized state controls a second transistor through a potential drop device, the second transistor may conduct slightly in its de-energized state and serve as a circuit impedance for the first, and the second transistor is connected back to the first through the transducer by which the first transistor is de-energized and the second transistor changes to its energized state. A general class of multivibrators using the asymmetrical circuit is also represented by bistable flip flops and free running multivibrators. Transistors of all the same NPN or PNP syntax and omission of resistors in the power stage enable compact integrated circuits to be formed on single semiconductor chips.

3,697,984

COMPUTER-ALARM INTERFACE SYSTEM

Roger F. Atkinson; Richard H. Parr, Jr., and Edward A. Weil, all of Nashville, Tenn., assignors to Clendenin Inventors Limited Partnership, Silver Spring, Md.

Filed May 23, 1969, Ser. No. 827,216
Int. Cl. G08b 25/00, 29/00
U.S. Cl. 340—408 **18 Claims**



A computer-alarm interface system interconnects conventional leased telephone line, polarity reversal alarms at multiple protected premises to a digital computer. The system, installed to function with a time-sharing computer equipped for communications, notifies police for other appropriate authorities of the nature and location of an alarm, trouble or tamper condition. Each protected premises is associated with a respective module at a central station which registers normal, alarm, or telephone line trouble conditions at the premises, and optionally provides tamper protection. The modules are continuously monitored for changes in conditions at their associated protected premises and transmit coded information pertaining to the nature and location of these changes to the computer. The latter provides a written record of this information at the office of the appropriate authority and also checks the alarm system to assure that the information received by the computer is correct.

A tamper-protection circuit employed with or without the computer includes a code tone or pulse transponder located at the protected premises and selectively triggered by an interrogation code tone or pulse from the module. Failure to receive the specified code tone or pulse over the telephone lines when triggered from the module location signifies tampering at the protected premises.

Another feature of the system is the provision of circuitry at the module location which permits condition indicators or lamps to have two active states: in one state the condition is indicated as not having been reported to the authorities; in the second state the condition is indicated as persisting but having been reported.

ERRATA

For Classes 340—15 thru 340—324; see:
Patent Nos. 3,698,009 thru 3,698,012

ERRATUM

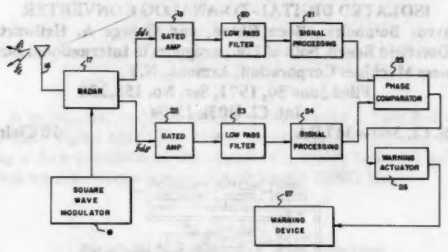
For Class 343—7.5; see:
Patent No. 3,698,013

3,697,985

REAR END WARNING SYSTEM FOR AUTOMOBILES

William R. Faris, Berkley, and William P. Harokopus, Royal Oak, both of Mich., assignors to The Bendix Corporation

Filed Sept. 23, 1970, Ser. No. 74,755
Int. Cl. G01s 9/00
U.S. Cl. 343—5 PD **10 Claims**



The invention is directed to a system which provides an audible or visual indication to a motor vehicle operator when another vehicle approaches the rear end of his vehicle in an adjacent lane or when a potentially interferring object is located behind the vehicle when backing up. The system covers the blind spots which are present on the right and left sides of the vehicle because of the inherent inadequacies of rearview mirrors and also the invisible area at the rear of the vehicle.

A range measuring doppler radar system has its antenna positioned to cover the area which lies on the two sides and behind a vehicle and which normally is within the well known blind spot. The radar system is squarewave modulated to sequentially produce two frequencies F_1 and F_2. Reflected signals from a moving target produce two doppler signals fd_1 and fd_2. The comparison of the relevant phases of the two doppler frequencies gives range information. The leading and lagging relationship of the doppler signals is indicative of whether the target is closing or opening with respect to the radar carrying base vehicle. The system is, therefore, readily made responsive to closing targets or slowly opening targets falling within a dangerously close range as the vehicle proceeds along a roadway. Fixed objects such as poles and signs along the road are also prevented from giving a warning signal by the phase information.

When the vehicle is backing up, objects or persons present behind the vehicle are detected and a warning given.

3,697,986

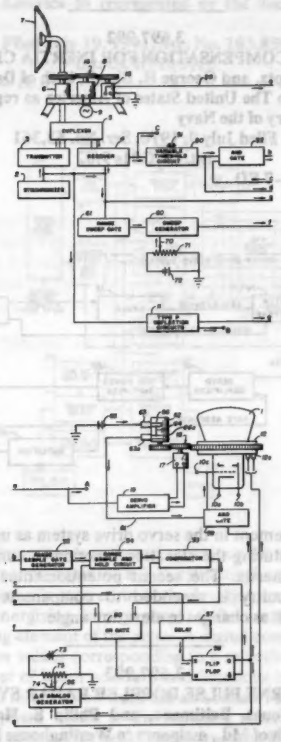
COLLISION AVOIDANCE SYSTEM

Kenneth G. Colby, Barboursville, Va., assignor to Sperry Rand Corporation

Filed Oct. 23, 1970, Ser. No. 83,396
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R **11 Claims**

A collision warning and collision avoidance radar navigation system employs a modified tau-proximity collision warning criterion to derive an improved presentation on a storage type of radar plan position cathode ray indicator. An intruding target is labelled dangerous if the ratio of intruder closing

range to his range rate is seen to be less than a predetermined value by the observation of the relative positions of synthesized radial lines or trails generated on the display for each target echo.

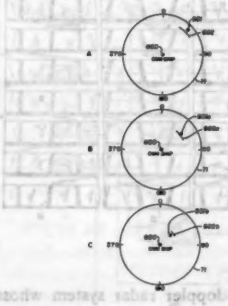


3,697,987

COLLISION AVOIDANCE SYSTEM

Richard J. Arthur, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Nov. 12, 1970, Ser. No. 88,783
Int. Cl. G01s 7/22
U.S. Cl. 343—5 EM **15 Claims**



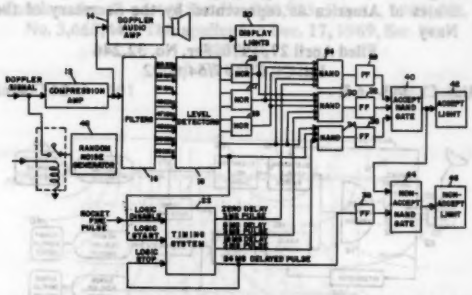
A collision warning and collision avoidance radar navigation system employs the tau collision warning criterion to derive an improved presentation on a radar plan position or other cathode ray indicator. An intruding target is labelled dangerous if the ratio of intruder closing range to his range rate is seen to be less than a predetermined value by the observation of the relative position of a synthesized bearing marker generated on the display for each target echo.

3,697,988

MUNITION BURST DETECTION SYSTEM AND METHOD

Arnold Klausner, Clifton, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 20, 1971, Ser. No. 107,911
Int. Cl. G01s 9/00
U.S. Cl. 343—5 R **9 Claims**



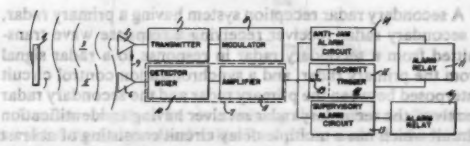
A munition burst detection system comprising: a Doppler or frequency shift detector; N frequency filters, said detector means comprising the input to said filters; N signal level detectors, said filters each respectively connected individually to one of said detectors; a pulse generating circuit providing (N−X)/2 sampling pulses, where X equals the number of fundamental burst frequency components, and X (N−2), said pulses occurring within the period of said munition burst; a burst detector, said burst detector means initiating the operation of said pulse generating circuit; (N−X)/2 NOR gates, the input to each successive NOR gate comprising the output of respective successive adjacent groups of two level detectors; (N−X)/2 NAND gates, the inputs of each respective NAND gate, except the last of said NAND gates, comprising (1) the outputs of each of said NOR gates, (2) the output of the second lowest frequency level detector, and (3) the sampling pulse corresponding in respective time sequence to the respective NAND gate into which each respective sampling pulse flows; and the input of the last of said NAND gates, constituting the output of the X lowest level detectors and the last occurring sampling pulse from said pulse generating circuit; (N−X)/2 flip-flops each respectively connected individually to one of said NAND gates; and an ACCEPT NAND gate, the inputs of said gate comprising the outputs of said flip-flops, said gate registering positively upon the detection of the proper Doppler frequencies in the munition burst.

3,697,989

INTRUSION DETECTION APPARATUS HAVING SUPERVISORY CONTROL MEANS

James R. Bailey, Milwaukee, Wis.; Paul I. Corbell, Dallas, Tex., and Lawrence B. Korta, Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed March 10, 1969, Ser. No. 805,591
Int. Cl. G01s 9/42
U.S. Cl. 343—5 PD **14 Claims**



The illustrated detection apparatus includes a radio frequency transmitter and a receiver having an amplifier which has a constant gain portion and a following roll-off

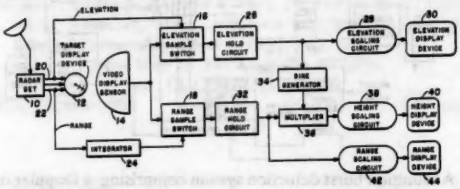
above the highest motion Doppler frequency signal to be detected. The transmitter is a Clapp oscillator. A free running multi-vibrator is coupled into a voltage regulator of the bias supply of the Clapp oscillator to superimpose a supervisory signal which falls within the roll-off portion.

3,697,990

METHOD AND APPARATUS FOR PRODUCING TARGET RANGE, HEIGHT, AND ELEVATION VOLTAGES FROM A PPI DISPLAY

George F. Emch, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 27, 1970, Ser. No. 32,246
Int. Cl. G01s 7/64, 9/02
U.S. Cl. 343—6 R 24 Claims



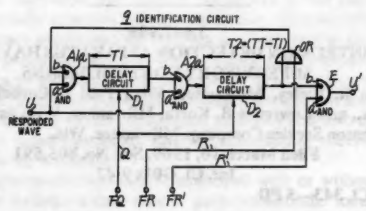
A method and apparatus for producing target elevation, range, and height information. The video display of a target display device is sensed by a video display sensor and applied to first and second sample and hold circuits. The output of the first sample and hold circuit is a signal indicative of target elevation. The output of the second sample and hold circuit is a signal indicative of target range. The output of the first sample and hold circuit is also fed into a sine generator, the output of which when multiplied with the output of the second sample and hold circuit is a signal indicative of target height.

3,697,991

SECONDARY RADAR RECEPTION SYSTEM

Takashi Ohyama, Tokyo; Akira Kawashige, Yokohama, and Takeo Miyashita, Saitama, all of Japan, assignors to Kabushikikaisha Tokyo Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed March 9, 1970, Ser. No. 17,739
Claims priority, application Japan, March 11, 1969, 44/18199; March 11, 1969, 44/29552
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 LC 6 Claims



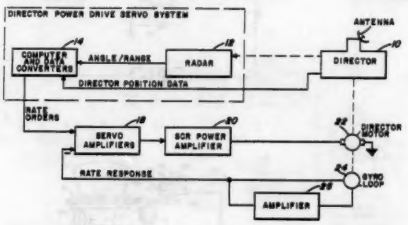
A secondary radar reception system having a primary radar, a secondary radar receiver receiving a response wave transmitted from a secondary radar in response to a radar signal from the primary radar, and a synchronization control circuit interposed between the primary radar and the secondary radar receiver, the secondary radar receiver having an identification circuit which has a multiple delay circuit consisting of at least two separate multiple delay circuits with at least one multiplier circuit being interposed therebetween, a first input terminal of the multiplier circuit being supplied with the output of a first separate multiple delay circuit, a second input terminal being supplied with the response wave from the secondary radar and an output terminal being connected to the input side of a second separate multiple delay circuit.

3,697,992

SERVO COMPENSATION FOR INERTIA CHANGE

James A. Kleptz, and George H. Bissell, both of Dalton, Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 9, 1970, Ser. No. 53,361
Int. Cl. G01s 9/02
U.S. Cl. 343—7 ED 6 Claims



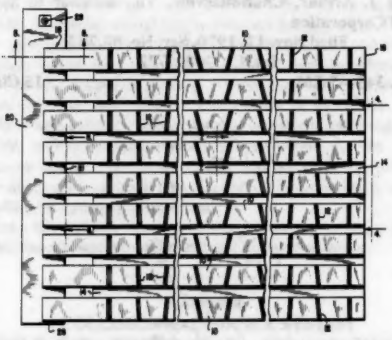
An improvement in the servo drive system as used in a missile director during the elevation function to compensate for changes in inertia. The secant potentiomenter and its associated circuitry is amended to compensate for inertia change as well as changes in elevation angle.

3,697,993

AIRBORNE PULSE DOPPLER RADAR SYSTEM

William S. Jones, Baltimore, and Philip S. Hacker, Silver Spring, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1969, Ser. No. 857,891
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 11 Claims



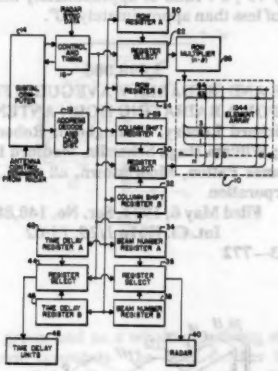
An airborne pulse doppler radar system whose sidelobe clutter amplitude is minimized by providing an antenna whose main beam subtends a small angle and whose radiated energy is concentrated in the main beam and the first few sidelobes and by providing a main beam band rejection filter whose rejection band is closely matched to the antenna main beam clutter frequency band.

3,697,994

AUTOMATIC BEAM STEERING TECHNIQUE FOR CYLINDRICAL-ARRAY RADAR ANTENNAS

Stephen A. O'Daniel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 19, 1971, Ser. No. 163,850
Int. Cl. H01q 3/26
U.S. Cl. 343—16 R 3 Claims



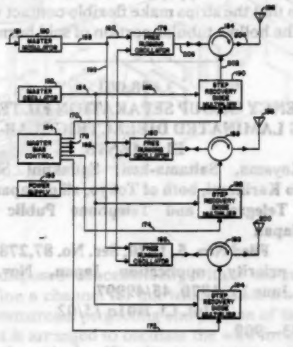
A digital computer system and technique for automatically steering the pencil beam of a 3-D cylindrical array radar antenna. The beam is steered in both elevation and azimuth by selectively energizing binary phase shifters associated with each radiating element of the array. A digital computer is used to store phase values corresponding to a selectively predetermined number of beam positions and functions in response to beam control information from the associated radar to output appropriate phase values to the radiating elements whereby agile steering of the array beam and/or random beam positioning can be obtained.

3,697,995

INCREASED POWER ELECTRONICALLY SCANNING INTEGRATED ANTENNA SYSTEM

Peter H. Kaftz, La Jolla, Calif., assignor to The Ryan Aeronautical Co., San Diego, Calif.

Filed Nov. 20, 1967, Ser. No. 684,263
Int. Cl. H01g 3/26; H03b 19/00
U.S. Cl. 343—100 SA 2 Claims



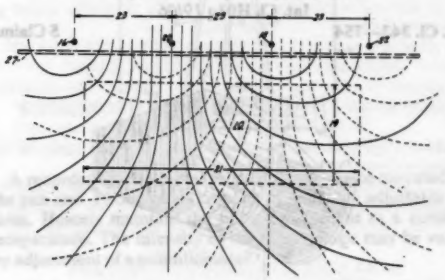
This invention concerns an electronically scanning integrated antenna system that has free running oscillators for providing large power output to each antenna and utilizes frequency multipliers, preferably step recovery diode multipliers, for controlling the frequency and phase of the free running oscillators outputs independently of the means for providing modulated intelligence to the radiated beam.

3,697,996

ELECTROMAGNETIC FIELD PRODUCING APPARATUS AND METHOD FOR SEQUENTIALLY PRODUCING A PLURALITY OF FIELDS

James T. Elder, Shoreview Village, and Donald A. Wright, Woodbury Village, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 840,973, July 11, 1969, Pat. No. 3,665,449. This application Dec. 17, 1969, Ser. No. 885,874
Int. Cl. G01s 1/02
U.S. Cl. 343—101 21 Claims



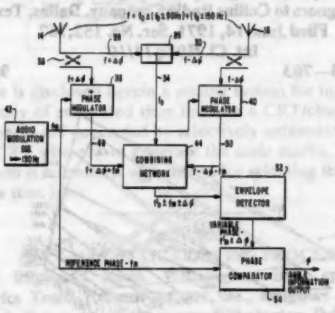
An apparatus and method for sequentially producing in a zone a plurality of electromagnetic fields. The lines of each field are produced to be generally curved and to have a direction at substantially every point in the zone substantially different from the direction of at least one other electromagnetic field line at that point. The apparatus comprises a plurality of field producing means each of which is responsive to applied electrical energy to produce an electromagnetic field. Means are provided for sequentially applying energy to the field producing means.

3,697,997

INTERFEROMETER AND ANGLE ENCODING NAVIGATION SYSTEM

Herbert W. Cooper, Hyattsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 13, 1970, Ser. No. 80,391
Int. Cl. G01s 1/18, 1/16
U.S. Cl. 343—108 R 10 Claims



A receiver system for determining the angle and direction between the longitudinal axis of a vehicle such as an aircraft and the direction of propagation from a source of radiation such as a VHF localizer navigation system. The receiver utilizes a pair of antennas having a mutual spacing determined by

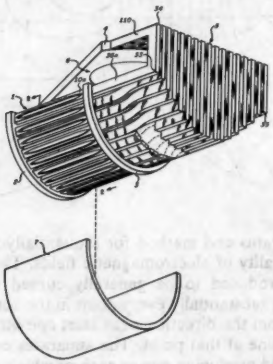
the desired accuracy and permitted ambiguities, mounted in the forward section of the aircraft such that one antenna is located on each side of the forward section of the aircraft. The antennas define a baseline therebetween which is substantially perpendicular to the longitudinal axis of the aircraft. The system permits the measurement of the direction of arrival of electromagnetic energy from the localizer system with respect to the baseline of the two antennas by converting the difference in RF phase of the signal respectively received by the pair of antennas to a difference in audio phase from a reference frequency generated by and in the receiver itself.

3,697,998

MULTIPLE BEAM ARRAY ANTENNA

Arthur H. Schaufelberger, Crystal Beach, Fla., assignor to Sperry Rand Corporation

Filed Oct. 5, 1970, Ser. No. 77,774
Int. Cl. H01q *19/06*
U.S. Cl. 343—754 **5 Claims**



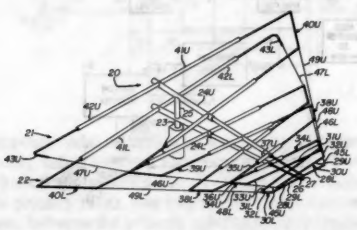
A high frequency energy array antenna conforming to the contour of a craft comprises a plurality of antenna array elements for providing partial collimation of multiple or scanned radiation or reception patterns. The antenna array cooperatively and selectively operates in energy exchanging relation with a geodesic energy distribution system for further collimation of the multiple or scanning radiation or reception patterns.

3,697,999

ROTATABLE BI-PLANAR SERIES-FED LOG-PERIODIC HF ANTENNA

Terry S. Cory, and Roger A. Markley, both of Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed June 14, 1971, Ser. No. 152,767
Int. Cl. H01q *11/10*
U.S. Cl. 343—763 **9 Claims**



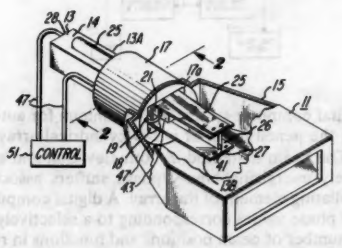
A unidirectional broadband horizontally polarized HF biplanar rotatable log-periodic antenna with the radiating element to boom structure of each of the planar antenna half structures substantially the same and flipped 180° one from the other. The bi-planar antenna is series fed through the lower boom acting as an infinite balun with the center conductor connected across to the forward end of the upper boom. The two half structures are relatively closely spaced with a dielectric insulator providing mutual structural support between the upper and lower booms of the half structures, and a vertical conductive material mast joins the structural booms both electrically and mechanically. The radiating elements are relatively fat truncated triangular teeth in a foreshortened log-periodic antenna employing a relatively large α angle of approximately 75°, a τ ratio of approximately 0.5, and an array angle of Ψ of less than approximately 10°.

3,698,000

FLEXIBLE AND SLIDABLE WAVEGUIDE FEED SYSTEM FOR A RADIATING HORN ANTENNA

Norman Richard Landry, Willingboro; Robert Jean Mason, Medford; William Hugh Schaedla, Medford Lakes, and Willard Thomas Patton, Moorestown, all of N.J., assignors to RCA Corporation

Filed May 6, 1971, Ser. No. 140,887
Int. Cl. H01q *1/20, 13/02*
U.S. Cl. 343—772 **6 Claims**



A radiating waveguide horn is provided having a hollow tubular portion and significantly broader radiating portion. The hollow tubular portion is adapted to coaxially receive therein a closely spaced rectangular waveguide feed structure. The waveguide feed structure is dimensioned to pass easily within the hollow tubular portion leaving a gap between the waveguide feed structure and the inner surface of the hollow tubular portion of the waveguide horn. A pair of elongated curved metal strips are fixed to one end of the waveguide feed structure with the metal strips generally extending along the length of said structure. The metal strips are configured and arranged relative to opposite walls of the waveguide feed structure so that the strips make flexible contact with the inner surface of the hollow tubular portion of said horn.

3,698,001

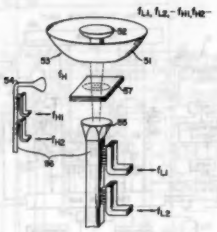
FREQUENCY GROUP SEPARATION FILTER DEVICE USING LAMINATED DIELECTRIC SLAB-SHAPED ELEMENTS

Masaki Koyama, Saitama-ken; Sadakuni Shimada, and Masahiro Karikomi, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Nov. 5, 1970, Ser. No. 87,278
Claims priority, application Japan, Nov. 11, 1969, 44/89764; June 11, 1970, 45/49997
Int. Cl. H01q *15/02*
U.S. Cl. 343—909 **13 Claims**

A frequency group separation filer device using slab-shaped dielectric elements, preferably disposed in a beam-forming region defined between an antenna and feeder, the filter being so designed as to separate in reception the composed beams of high and low frequency groups respectively comprised of

frequency components within a frequency region higher than or included in the microwave region into the individual original high and low frequency groups, and conversely in transmission to compose the separate beams of such high and low frequency groups. The branching filter comprises an assembly of a plurality of laminated plate dielectric elements each having a thickness equal to substantially one-fourth the wavelength of the central frequency of at least the aforesaid



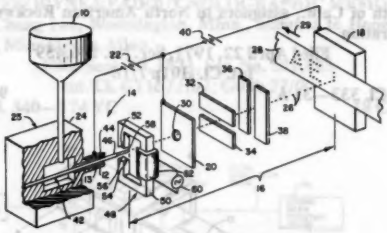
high frequency group and as a whole possessing at least two different dielectric constants. The filter further includes at least one further dielectric element having a thickness of about one-fourth the wavelength of the substantially central frequency of the low frequency groups disposed at at least one of the forward and rear sides of the assembly of laminated dielectric elements.

3,698,002

DROPLET SYNCHRONIZATION FOR ELECTROSTATIC PRINTING

Sherman P. Appel, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Aug. 18, 1971, Ser. No. 172,793
Int. Cl. G01d *15/18*
U.S. Cl. 346—1 **10 Claims**



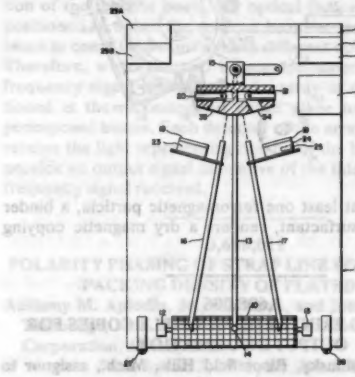
A wire is disposed concentrically within the nozzle of a printer to define a channel for ink which issues from the nozzle along a downstream projecting end portion of the wire. An electromagnet is arranged to oscillate the wire for imparting a synchronous disturbance to ink flowing about said end portion, whereby ink droplets may be generated at a uniform frequency in a stream moving across a span in which the droplets are deflected for printingly impinging a carrier spaced downstream from the nozzle.

3,698,003

RECORDER ALARM SYSTEM

Martin J. Sharki, and Charles J. Mazoch, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 28, 1970, Ser. No. 76,141
Int. Cl. G01d *13/26*
U.S. Cl. 346—17 **9 Claims**



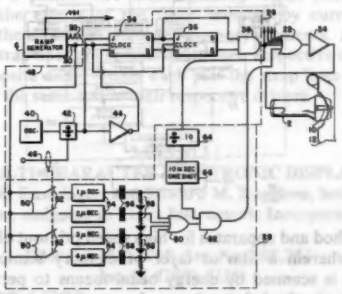
A recorder alarm system includes a light source mounted on the pen arm. Photovoltaic cells are mounted on adjustable set arms. Heaters maintain the photovoltaic cells at a constant temperature. The intensity of the eight source may be varied by adjustment of a potentiometer.

3,698,004

RECORDER WITH TIME LINE GENERATOR AND INTERVAL ENCODER

Peter R. Lone, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1971, Ser. No. 176,585
Int. Cl. G01d *9/00*
U.S. Cl. 346—23 **9 Claims**



There is disclosed herein a coding system for indicating the periodicity of generated time lines on a CRT/chart recorder. Code marks are generated by selectively unblanking the beam of the CRT whereby to generate the code marks. The encoding means is correlated with means for selecting the periodicity of the time lines.

3,698,005

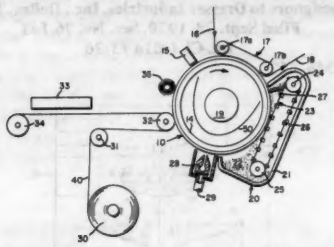
DRY MAGNETIC COPYING PROCESS

George Raymond Nacci, Wilmington, Del., and Richard Charles Toole, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1970, Ser. No. 37,706
Int. Cl. G01d *15/12*; H01v *3/04*
U.S. Cl. 346—74 MT **14 Claims**

The use of a recording member comprising a transparent support, a stratum of magnetic material and a thin coating of

polysilicic acid, in combination with a dry toner powder, preferably one comprising a plurality of toner particles each of



which contains at least one ferromagnetic particle, a binder and a cationic surfactant, renders a dry magnetic copying process feasible.

3,698,006

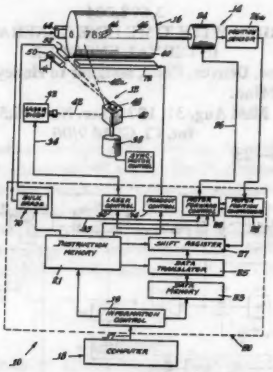
HIGH SPEED PRINTER OF MULTIPLE COPIES FOR OUTPUT INFORMATION

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 754,607, Aug. 28, 1968, abandoned, and a continuation-in-part of Ser. No. 791,441, Jan. 15, 1969, Pat. No. 3,531,441. This application May 29, 1969, Ser. No. 828,859

Int. Cl. G03g *15/00;* **H01n** *1/24;* **H04n** *1/30*

U.S. Cl. 46—74 ES **3 Claims**



A method and apparatus for high speed printout of multiple copies wherein a film or layer of memory semiconductor material is scanned by energy beam means to permanently store therein the information to be reproduced. The film is capable of having discrete portions thereof reversibly altered between a high resistance blocking condition and a low resistance conducting condition, the film normally being in one condition. The film of semiconductor material forms an information storage surface on a rotating drum, and energy pulses are synchronized with and applied to selected portions of the semiconductor material on the drum surface for altering the film at said select portions thereof from said one normal condition to the other condition to store the information in the material forming the film. Computer means are provided to convert bits of data input information into energy pulses and to synchronize these pulses wit predeterminable topographic sites on the semiconductor film surface where the pulses impinge and alter the condition of the surface to permanently store the information. The retrieval of the stored information is non-destructive to the stored information and high speed print-out of multiple copies is possible without further need of the computer means.

3,698,007

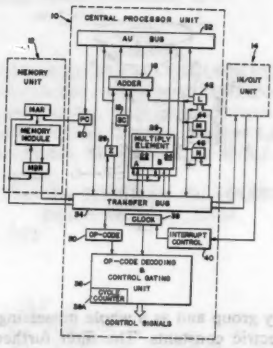
CENTRAL PROCESSOR UNIT HAVING SIMULATIVE INTERPRETATION CAPABILITY

Ronald D. Malcolm, Marlborough; William J. Phelan, North Reading, and Thomas L. Sangiolo, Hudson, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 662,699, Aug. 23, 1967. This application Nov. 30, 1970, Ser. No. 93,901

Int. Cl. G05b *19/18*

U.S. Cl. 444—1 **6 Claims**



An electronic digital computer provides real time simulation of the operation of a different digital computer with a minimal amount of special interpretive software. The central processor of the simulating computer develops and stores in one register the memory address of the operands processed by the program being interpreted. In another register, the simulating processor develops and stores the memory address of an interpretive subroutine for each instruction of the program being interpreted. The simulating computer in addition operates a third central processor register as an effective program counter during execution of simulative interpretation. A fourth register is used to supply the memory sector portion of the memory addresses developed above. Each of the four registers is directly accessible by other elements of the central processor.

3,698,008

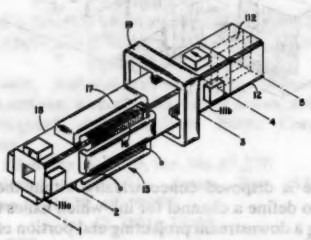
LATCHABLE, POLARIZATION-AGILE RECIPROCAL PHASE SHIFTER

Roger G. Roberts, Placentia, and Jerry A. Algeo, Buena Park, both of Calif., assignors to North American Rockwell Corporation

Filed April 22, 1971, Ser. No. 136,459

Int. Cl. H01p *1/18*

U.S. Cl. 333—31 A **9 Claims**



A latchable ferrite phase shifter useful in microwave phase-scanned antenna arrays and having reciprocal phase-shift properties. An axial arrangement of selectably magnetizable magnetization means in cooperation with the latchable ferrite allows use of a single longitudinal ferrite rod and fewer mag-

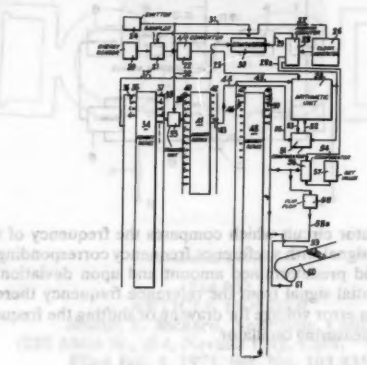
netization elements, as to demonstrate lower insertion losses and lower manufacturing costs, as well as latchable reciprocal phase shift properties.

3,698,009

PROCESS FOR MEASURING THE SAMPLED AMPLITUDE OF A SEISMIC SIGNAL

Maurice Barbier, Ousse, France, assignor to Societe National des Petroles D'Aquitaine Tour Aquitaine, Paris, France

Filed Oct. 21, 1970, Ser. No. 82,708
Claims priority, application France, Nov. 28, 1969, 6941157
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 CP **10 Claims**



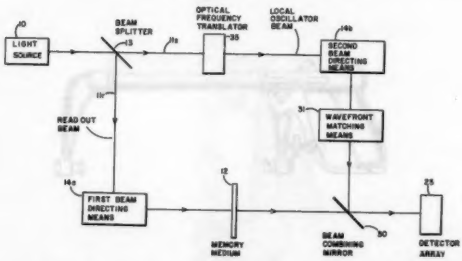
A process for measuring the sampled amplitude of a seismic signal received by a sensing device after the said signal has travelled through a continuous medium, in which the content of an adding counter for each basic unit of time is compared in turn with the contents of each of a first series of memories, containing, in digital form, the instants of emission of a sequence of energy impulses, in which the sampled digital value of the signal supplied by the sensor is received in another series of memories, the elements of which are identified in relation to the time, and in which each sample is given a number of addresses determined by the instant of sampling and the various instants of prior emissions preceding the instant of sampling, with a period shorter than the maximum time taken for the mechanical waves to travel through the ground.

3,698,010

HETERODYNE READOUT HOLOGRAPHIC MEMORY

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 20, 1971, Ser. No. 181,803
Int. Cl. G11c *11/02*; G02b *27/00*
U.S. Cl. 340—174 YC **18 Claims**



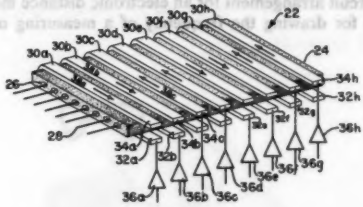
A holographic optical memory utilizes an optical heterodyne technique to significantly increase the signal-to-noise ratio during the readout stage of operation. A light source provides a coherent light beam which is split into a readout beam and a local oscillator beam. The readout beam is directed to one of the holograms stored in the memory medium and a portion of the read out beam is diffracted by the hologram to form a reconstructed image of the bit pattern stored in the hologram at the reconstructed image plane. The local oscillator beam is superimposed with the diffracted portion of the readout beam. An optical frequency translator is positioned in either the readout beam or the local oscillator beam to cause the beams to have different optical frequencies. Therefore, when the two beams are superimposed, a beat frequency signal is produced. An array of detectors is positioned at the reconstructed image plane to receive the superimposed beams. Each detector of the array is positioned to receive the light representing one bit of the bit pattern and to provide an output signal indicative of the intensity of the beat frequency signal received.

3,698,011

POLARITY PHASING OF STRAP LINE FOR HIGHER BIT PACKING DENSITY OF PLATED WIRE

Anthony M. Apicella, Jr., Massillon, and John T. Franks, Jr., Tallmadge, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed April 12, 1971, Ser. No. 132,947
Int. Cl. G11c *7/02, 11/04, 11/14*
U.S. Cl. 340—174 DC **2 Claims**



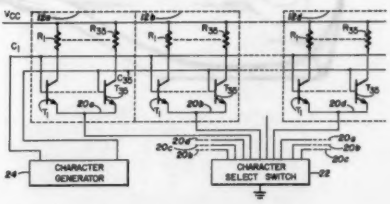
A system for connecting the strap drivers to their respective straps of a plated wire memory array which substantially reduces the effects of the fields induced by current flow through the straps on adjacent memory elements. Adjacent pairs of strap lines are connected to their respective drivers at their opposite ends. Within each pair the strap lines are connected at the same end to their respective drivers.

3,698,012

MULTI-CHARACTER ELECTRONIC DISPLAY

Clifford H. Ensminger, and Edward M. Ruggiero, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,261
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 R **6 Claims**



Disclosed are multiple character electronic display devices utilizing plurality of character matrices, each of which includes plurality of thermally isolated semiconductor mesas which are heated by current passed through a resistance. The

current in each mesa is controlled by a transistor formed therein, and such transistors may have a common collector voltage and a common emitter voltage supply lead which may be individually closed by a switch to enable a desired character. The bases of the transistors of corresponding mesas in all of the character matrices may be connected to common control lines so that all character matrices may be controlled by the same character generator.

A particular diffusion pattern for the individual elements of the matrices is also disclosed which utilizes an extended collector transistor having a longitudinally extending, double diffused tunnel to provide cross connections from the control lines to the base contacts of the elements of an array.

3,698,013

CIRCUIT ARRANGEMENT FOR AN ELECTRONIC DISTANCE MEASURING DEVICE FOR DRAWING THE FREQUENCY OF A MEASURING OSCILLATOR TOWARDS A SET POINT FREQUENCY WHICH IS HIGHER OR LOWER, RESPECTIVELY, BY A CERTAIN PREDETERMINED VALUE

Marcel Hossmann, Zurich, and Alfred Barh, Turgi, both of Switzerland, assignors to Albiswerk Zurich AG, Zurich, Switzerland

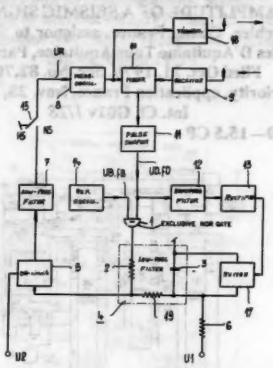
Filed June 28, 1971, Ser. No. 157,378

Claims priority, application Switzerland, July 10, 1970, 10474/70

Int. Cl. H03b *3/04*

U.S. Cl. 343—7.5 **1 Claim**

A circuit arrangement for an electronic distance measuring device for drawing the frequency of a measuring oscillator towards a set point frequency which is higher or lower, respectively, by a certain predetermined amount or value than the frequency of a similar measuring oscillator at the counter station. From the measuring waves of both measuring oscillators there is produced at such circuit arrangement, by mixing, a differential signal. The circuitry of the invention also contains



a discriminator circuit which compares the frequency of the differential signal with a reference frequency corresponding to the aforesaid predetermined amount and upon deviation of this differential signal from the reference frequency there is produced an error voltage for drawing or shifting the frequency of such measuring oscillator.

DESIGNS

OCTOBER 10, 1972

224,901
BUCKLE
Lorenzo Scaretti, 9 Piazza Madama, Rome, Italy
Filed July 27, 1970, Ser. No. 24,144
Claims priority, application Italy May 22, 1970
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—420

224,902
ARTICLE HOLDER
Robert E. Rickard, Newcastle, Calif.
(220 Main St., #4, Nevada City, Calif. 95959)
Filed Jan. 4, 1971, Ser. No. 103,935
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

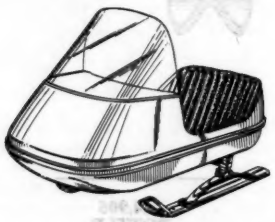
224,903
HACKSAW FRAME
Raymond C. Dreier, 3450 N. Lake Shore Drive, Chicago, Ill. 60657
Filed Jan. 11, 1971, Ser. No. 105,781
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96

224,904
WALL BRACE
Manuel J. Davis, Santa Cruz, and Carl A. Nelson, Glendale, Calif., assignors to M-J Metal Products, Inc.
Filed June 25, 1970, Ser. No. 23,664
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—228

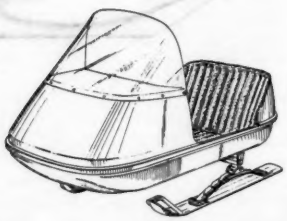
224,905
BOTTLE
Patrick Paul Edouard Brassart, 44 Rue la Boetie, Paris, France
Filed June 4, 1971, Ser. No. 150,248
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

224,906
RESTAURANT BUILDING
E. Wallace Barr, Jr., Bowling Green, Ky., assignor to Kentucky Rib-Eye, Inc., Bowling Green, Ky.
Filed Mar. 10, 1971, Ser. No. 123,119
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

224,907
SNOWMOBILE SLEIGH
Yves Anselme Lapointe, Valcourt, Quebec, and Anthony D. MacKeen, Drummondville, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Nov. 2, 1970, Ser. No. 25,779
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24

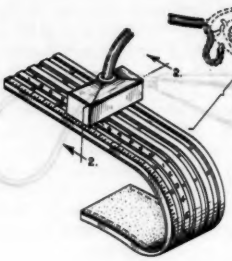


224,908
SNOWMOBILE SLEIGH
Anthony D. MacKeen, Drummondville, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Nov. 2, 1970, Ser. No. 25,770
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—27



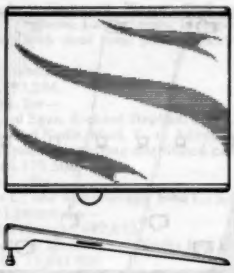
224,909
COMBINED AMPLIFIER AND SPEAKER UNIT
Stephen R. Krause, Baltimore, Md., assignor of a fractional part interest to Edward Stringer, Randallstown, Md.
Filed Oct. 16, 1970, Ser. No. 25,522
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

224,910
COMBINED ADHESIVE MAGNETIC-ELECTRIC TAPE, RULER AND ACOUSTIC COUPLING
St. Barth Alaska, 3811 S. Scoville Ave., Berwyn, Ill. 60402
Filed Oct. 22, 1970, Ser. No. 26,728
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

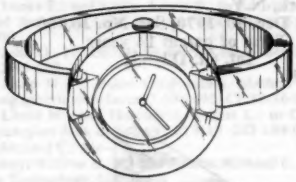


224,911
DESK TELEPHONE
George Perkins, Laguna Beach, Calif., assignor to American Telecommunications Corporation, El Monte, Calif.
Filed Aug. 23, 1971, Ser. No. 174,283
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

224,912
ADJUSTABLE RAMP
Arthur R. Bennett, 4019 SW. 12th St., Plantation, Fla. 33314
Filed Nov. 5, 1970, Ser. No. 25,835
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D41—1

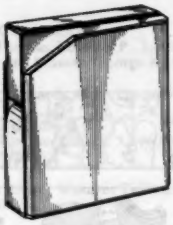


224,913
COMBINED WRISTWATCH AND STRAP
Carlo Maroni, 24 Via Rodolfo Benini, Rome, Italy
Filed Aug. 4, 1971, Ser. No. 169,162
Claims priority, application Italy Feb. 4, 1971
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8



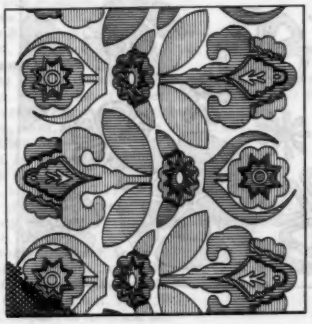
224,914
JEWELRY PENDANT
Andrew Mitchell David, 107 Wythe Crescent Drive, Hampton, Va. 23361
Filed Oct. 8, 1970, Ser. No. 25,275
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16

224,915
CIGARETTE LIGHTER
Kenjiro Goto, 28–13, 5-chome, Sakurajosui, Setagaya-ku, Tokyo, Japan
Filed May 24, 1971, Ser. No. 146,601
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

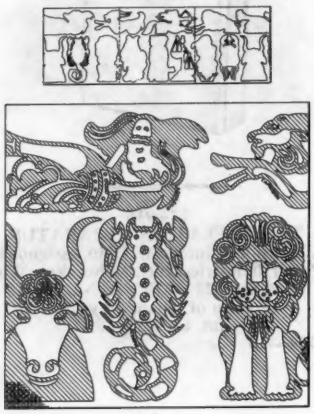


224,916
TIRE INFLATION APPARATUS
Robert W. Houston, Cincinnati, Ohio, assignor to Applied Power Industries, Inc., Milwaukee, Wis.
Filed Sept. 21, 1970, Ser. No. 25,088
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13

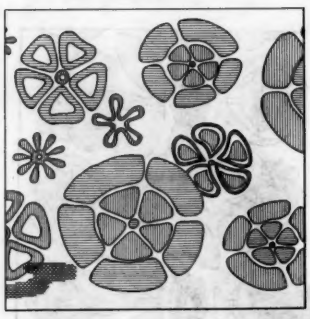
224,917
PAPER TOWELING
Ronald L. Rae, Berkley, Mich., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed Dec. 21, 1970, Ser. No. 26,573
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2



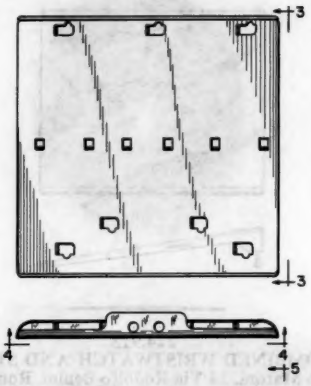
224,918
PAPER TOWELING
Ronald L. Rae, Berkley, Mich., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed Dec. 21, 1970, Ser. No. 26,574
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2



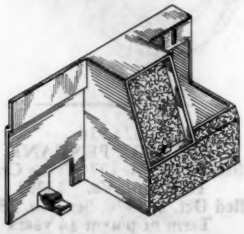
224,919
PAPER TOWELING
Eugene L. Rohde, East De Pere, Wis., assignor to Fort Howard Paper Company
Filed Mar. 18, 1971, Ser. No. 125,911
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2



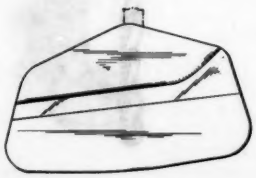
224,920
BROILER REFLECTOR OR THE LIKE
Richard D. Reagan, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jan. 28, 1971, Ser. No. 110,793
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D81—10



224,921
INSERT FOR AN ELECTRIC SHAVER CARRYING CASE
John F. Daniels, Bridgeport, and Robert A. Mockovak, Newtown, Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 26,700
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1



224,922
GEAR SHIFT HOUSING FOR A BICYCLE
Hans-Jurgen Lannoch, Hochstetten, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany
Filed Feb. 19, 1971, Ser. No. 117,221
Claims priority, application Germany Nov. 27, 1970
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaron, Marvin Robert; Hammett, Warren Gail; and Oberst, James Francis, to Bell Telephone Laboratories, Incorporated. Dual-mode phase-locked loop with dead zone phase detector. 3,697,690, Cl. 178-69.50r.

AB Karlshamns Oljefabriker: *See—*
Riiner, Ulo, 3,697,294.

Abbott Laboratories: *See—*
Kurath, Paul; and Egan, Richard Stephan, 3,697,547.

Abramson, Carl N.; and Nadir, Mark T., to Adaptive Technology, Inc. Data processing system employing distributed-control multiplexing. 3,697,959, Cl. 340-172.500.

Abromavage, John C.: *See—*
Sweeten, Orlin L.; and Abromavage, John C., 3,696,805.

Access Equipment Limited: *See—*
Pearce, Douglas Henry, 3,697,032.

Achten, Kort Joseph, to Illinois Tool Works Inc. Electrical plug contact. 3,697,931, Cl. 339-95.00r.

Acker, Jacob, & Sohne oHG: *See—*
Acker, Josef; Hofmann, Albert; and Fruhholz, Georg, 3,696,845.

Acker, Josef; Hofmann, Albert; and Fruhholz, Georg, to Acker, Jacob, & Sohne oHG. Curtain. 3,696,845, Cl. 139-383.

Ackermann, Hans; and Beffa, Fabio, to Ciba-Geigy AG. Water-soluble disazo pyrazole dyestuffs containing fiber-reactive substituents. 3,697,500, Cl. 260-154.000.

Acree, Elick H.; Brashear, Hugh R., Jr.; and Case, Forrest N., to United States of America, Atomic Energy Commission. Device for inserting tagged sand into ocean floor. 3,697,756, Cl. 250-106.00t.

Adachi, Shoichi: *See—*
Iwai, Tadashi; Yamashina, Hisao; Takagi, Tetitsu; and Adachi, Shoichi, 3,697,386.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Keying system capable of producing piano-tone effects for use in electronic musical instruments. 3,697,662, Cl. 84-1.130.

Adams, James E.; and Leder, Lewis B., to Xerox Corporation. Tuning method for plural layer liquid crystal filters. 3,697,152, Cl. 350-158.000.

Adams, John Q., IV. Device facilitating use of dental floss. 3,696,821, Cl. 132-91.000.

Adams, Ladd M., to Balon Corporation. Method and apparatus for finishing spherical surfaces. 3,696,695, Cl. 82-16.000.

Adams, Lloyd M.; and Hoelscher, Robert L., to Cubic Corporation. Film transport deck unit. 3,697,017, Cl. 242-189.000.

Adams, Richard C.: *See—*
Javarey, William E., Jr.; and Adams, Richard C., 3,697,359.

Adaptive Technology, Inc.: *See—*
Abramson, Carl N.; and Nadir, Mark T., 3,697,959.

Adaptronics, Inc.: *See—*
Barron, Roger L., 3,697,957.

Addressograph-Multigraph Corporation: *See—*
Booth, Thomas A., 3,697,177.

Advanced Management Engineering & Research Co.: *See—*
Sweeten, Orlin L.; and Abromavage, John C., 3,696,805.

AEG-Elotherm GmbH: *See—*
Seulen, Gerhard; and Von Starck, Axel, 3,696,858.

Aerojet-General Corporation: *See—*
Lucas, James M.; Suder, Jack K.; and Vander Wall, Eugene M., 3,696,616.

Aerojet-General Corporation, mesne: *See—*
Tidball, Robert A., 3,697,385.

Aerotronic Associates, Inc.: *See—*
Grant, John; and Longley, Miner R., 3,697,815.

Afanador, Carlos P.: *See—*
Ischabrun, Richard G.; and Afanador, Carlos P., 3,697,910.

Agfa-Gevaert Aktiengesellschaft: *See—*
Ehgartner, Gabriele; and Wilsch, Herbert, 3,697,018.
Riester, Oskar; and Hase, Marie, 3,697,282.
Wagner, Karl, 3,696,721.

Agfa-Gevaert N.V.: *See—*
De Cock, Etienne Marie, 3,697,759.

Agnew, Frank R.: *See—*
Goldstein, Robert P.; and Agnew, Frank R., 3,697,227.

Ahrens, Gerhard W. Nonhygroscopic non-sugarbase noncariogenic-vitamin C releasable base material for use in the preparation of suckable tablets, lozenges and chocolate. 3,697,641, Cl. 424-38.000.

Aihara, Katzuzo: *See—*
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.

Air King Corporation: *See—*
Bobrick, Mitchell, 3,697,742.

Air Plastic Service GmbH: *See—*
Stirzenbecher, George H., 3,697,728.

Air Products and Chemicals, Inc.: *See—*
Longswoth, Ralph C., 3,696,627.
Ness, Leif A.; and Thomas, Edmund P., 3,696,637.
Robba, William A.; and Klasson, George A., 3,697,721.

Airco, Inc.: *See—*
Bryant, Gerald T.; Linhardt, Hans D.; and Nichols, Kenneth E., 3,696,975.

Aisin Seiki Kabushiki Kaisha: *See—*
Kitano, Shin; and Momose, Yutaka, 3,696,897.
Sawada, Oshio, 3,696,769.

Akao, Mutsuo: *See—*
Tatsuta, Sumitaka; Ueno, Wataru; Tajima, Tatsuya; and Akao, Mutsuo, 3,697,305.

Akita, Eiichi: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.

Aktiebolaget Bofors: *See—*
Borjeson, Jan Lennart, 3,697,848.

Aktiebolaget Celleco: *See—*
Jakobsson, Karl Folke Olof; and Forsner, Bo Ake, 3,696,927.

Aktiebolaget Karlstads Merkaniska Werkstad: *See—*
Ordqvst, Olof Albert, 3,697,207.

Akustische u.Kino-Gerate Gesellschaft m.b.H.: *See—*
Fidi, Werner, 3,697,059.

Albert, Dorothy S.: *See—*
Haines, Paul G.; and Albert, Harry Elmer, 3,697,470.

Albert, Harry Elmer: *See—*
Haines, Paul G.; and Albert, Harry Elmer, 3,697,470.

Albiswerk Zurich AG: *See—*
Hossmann, Marcell; and Barh, Alfred, 3,698,013.

Albrecht, Lance M.: *See—*
Goldman, Samuel C.; and Albrecht, Lance M., 3,697,956.

Albright, Penrose Lucas, to Zero Manufacturing Company. Teat cup assembly. 3,696,790, Cl. 119-14.470.

Alco Standard Corporation: *See—*
Bielefeldt, Irvin P., 3,697,725.

Aleckner, John F., Jr., to Union Carbide Corporation. Coated ethylene-polar monomer copolymer substrate. 3,697,311, Cl. 117-72.000.

Alexander, James M., to Stillwell-Gerard Construction Co. Post implanting method and vehicular apparatus therefor. 3,696,625, Cl. 61-53.500.

Algeo, Jerry A.: *See—*
Roberts, Roger G.; and Algeo, Jerry A., 3,698,008.

Alleman, Ronald D. Skip frame visual display device. 3,696,537, Cl. 40-78.070.

Allen, Michael George: *See—*
Rambosek, George M.; Allen, Michael George; and Van Dyke Tiers, George, 3,697,485.

Alliance Manufacturing Company, Inc.: *See—*
Deming, Andrew Frank; and Lucas, Clyde M., 3,696,680.

Allied Chemical Corporation: *See—*
Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, 3,697,564.
Balint, Laszlo J.; Lazarus, Stanley D.; and Russell, William N., 3,697,579.
Beyleveld, Wilhelmus M.; Oxenrider, Bryce C.; and Woolf, Cyril, 3,697,562.
Bhuta, Mahendra; and Sacks, William, 3,697,368.
Little, Edwin D., 3,697,584.
Wells, Rodney L.; Ulmer, Harry E.; and Mason, Paul J., 3,697,249.

Allied Research Products, Inc.: *See—*
Duchene, Joseph R., 3,697,392.

Allied Tube & Conduit Corporation: *See—*
Krengel, Theodore H.; Ostrowski, Arthur E.; and Raymond, Anthony J., 3,696,503.

Allirot, Rene Joseph; Darcas, Claude; and Jobert, Raymond, to Ugine Kuhlmann. Purification of nitriles. 3,697,576, Cl. 260-465.300.

Allmanna Svenska Elecktriska Aktiebolaget: *See—*
Suvanto, Antti; and van Santen, Aart, 3,697,375.

Allred, G. Allen: *See—*
Nielson, Jay P.; and Allred, G. Allen, 3,697,112.

Alps Electric Co., Ltd.: *See—*
Ohkita, Masao, 3,697,713.

Alsberg, Henry, to Richardson, Company, The. Non-crazing, biaxially oriented styrene-methyl methacrylate copolymer sheets. 3,697,494, Cl. 260-86.700.

Alton Box Board Company: *See—*
Reisman, Abraham J.; and Wilkinson, Thomas B., III, 3,697,365.

Aluminium Company of America: *See—*
Howle, Clement Roger, 3,697,393.

Aluminum Company of America: *See—*

Hunsicker, Harold Y., 3,697,260.

Alwitt, Robert S.; and Santway, Robert W., to Sprague Electric Company. Electrolytic capacitor having an electrode with a metallized cracked oxide surface. 3,697,822, Cl. 317-230.000.

Amada Company Limited: *See—*
Hamada, Teruma, 3,696,658.

Amano, Hideo: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Amberg, Ralph G.: *See—*
Amberg, Stephen W.; and Amberg, Ralph G., 3,697,369.

Amberg, Stephen W.; and Amberg, Ralph G., to Owens-Illinois, Inc., mesne. Plastic lined receptacle or the like. 3,697,369, Cl. 161-250.000.

Ambrose, Henry B. Fish alarm and circuit continuity tester. 3,696,546, Cl. 42-17.000.

Ambrose, Jere B., to Northern Fibre Produs Company. Decorative seat welt. 3,696,771, Cl. 112-417.000.

Amchem Products, Inc.: *See—*
Kuehner, Mark A., 3,697,332.

American Air Filter Company, Inc.: *See—*
Engleman, Donald E., 3,696,592.

American Aluminum Company: *See—*
Farley, Holt A., 3,697,045.

American Aniline Products, Inc.: *See—*
Genta, Guido R., 3,697,554.

American Cyanamid Company: *See—*
Berenson, Herman; Stonier, Robert Alden; and Wiese, Eugene Everett, 3,697,655.
Brouchu, Rene Robert; and Taylor, Lytton, 3,697,353.
Ermidis, Nicholas Peter, 3,697,620.
Giambalvo, Vito Albert; and Ruby, Philip Randolph, 3,697,464.
Maulding, Donald Roy, 3,697,432.
Nagy, Daniel Elmer, 3,697,370.
Nakajima, Akira; and Suzuki, Hiroshi, 3,697,218.
Pang, Michael, 3,697,400.

American Data Systems, Inc.: *See—*
Macy, James R., 3,697,947.

American Digital Corporation: *See—*
Bagland, Evan L., III; and Wagner, Robert L., 3,696,739.

American Home Products Corporation: *See—*
Buzby, George C., Jr.; Greenspan, George; and Buhle, Emmett L., 3,697,379.
Humber, Leslie G., 3,697,581.
Jacobs, Donald R., 3,697,033.

American Hospital Supply Corporation: *See—*
Mueller, Floyd F., 3,697,846.

American Poly-Plastics Laboratories, Inc.: *See—*
Palombo, Albert M., 3,697,457.

American Seating Company: *See—*
Barecki, Chester J.; and Schneider, Kenneth O., 3,697,130.

American Standard Inc.: *See—*
Parkison, Richard G., 3,697,002.

American Store Equipment Corporation: *See—*
Schulte, Donald W., 3,697,147.

American Telephone and Telegraph Company: *See—*
Buonsante, John J.; Freericks, Lambert; Haarmann, Howard J.; and Sieglinger, John C., 3,697,702.

American Velcro, Inc.: *See—*
Perina, Joseph; and Hlavaty, Albert E., 3,696,472.

American Waagner Biso Company, Inc.: *See—*
Kemmetmueller, Roland, 3,697,381.

Amerock Corporation: *See—*
Livingston, Richard D., 3,697,140.

Amerola Products Corporation: *See—*
Merola, Anthony, 3,697,069.

Ametek, Inc.: *See—*
Harland, Philip W., 3,696,687.

Amos, Homer C.: *See—*
Strickland, Edward T.; and Amos, Homer C., 3,697,241.

AMP Incorporated: *See—*
Hammell, Kemper Martel, 3,697,928.
Henschen, Homer Ernst, 3,697,925.
Jacobs, Wayne John; Fritz, Robert William; and Peiffer, Howard Richard, 3,697,389.
Kunkle, John Philip; and Kunkle, James Raymond, 3,697,927.
Roydon, William Merry, 3,697,934.

Ampex Corporation: *See—*
Hathaway, Richard Allen, 3,697,679.
Van Heeckeren, Jacob; Rodal, David R.; and Markevitch, Bob V., 3,697,149.

Amundsen, Paul D.; and Liautaud, John N., to Fendall Company. Protective faceshield. 3,696,442, Cl. 2-8.000.

Anchor Hocking Corporation: *See—*
Shonebarger, Francis J., 3,697,242.

Anders, Dietmar, to Berstorff, Hermann, Maschinenbau GmbH. Extruder worms for extruding synthetic resins. 3,696,913, Cl. 198-213.000.

Anderson, Aldin R.; Jennings, John D.; and Killerby, Walter E., to Western Electric Company, Incorporated. Apparatus for producing a sealed article. 3,696,986, Cl. 228-3.000.

Anderson, Charles M.; and Ratcliff, Edward H., Jr., to Stamler, W. R., Corporation. Variable-stroke car shifting apparatus. 3,696,754, Cl. 104-162.000.

Anderson, Gene A., to Dow Chemical Company, The. Soil sampling device. 3,696,873, Cl. 175-20.000.

Anderson, Harold C.; and Graff, David F., to Litton Systems, Inc. Microwave generating apparatus including spurious signal suppression means. 3,697,804, Cl. 315-105.000.

Anderson, John E. Fluid actuated toy track system with constant flow valve. 3,697,071, Cl. 273-86.00d.

Anderson, Melvin R.: *See—*
Breed, Charles P.; and Anderson, Melvin R., 3,697,740.

Anderson, Wallace E.; Krall, Albert D.; and Sycles, Albert M., to United States of America, Navy. Series electrical, parallel thermal gunn device. 3,697,831, Cl. 317-235.00r.

Anderson, William J.: *See—*
Taylor, Larry H.; Porter, William D.; Anderson, William J.; and Cancer, Ralph A., 3,697,007.

Anding, Fred H. Hoof maintenance stand. 3,696,869, Cl. 168-44.000.

Andraschek, Hans-Joachim; and Zentner, Erich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Thermoplastic moulding compositions and shaped articles on the basis of polyvinyl chloride. 3,697,349, Cl. 156-219.

Andres, Rudolf, to Daimler-Benz Aktiengesellschaft. Installation for indicating the closing condition of vehicle doors, especially of motor vehicle doors. 3,697,943, Cl. 340-520.000.

Andrews, Timothy Douglas; Short, Glynn David; and Thomas, Ieuan, to Imperial Chemical Industries Limited. Radiation sensitive materials containing bipyridilium salt of a strong acid. 3,697,528, Cl. 260-294.900.

Andris, Fred A. Automatic volumetric chemical mixer. 3,697,052, Cl. 259-8.000.

Andrus, Paul G., to Xerox Corporation. Development apparatus. 3,696,785, Cl. 118-637.000.

Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, to Allied Chemical Corporation. Fluorocarbon acids and derivatives. 3,697,564, Cl. 260-408.000.

Anstin, Wayne D., to Varian Adco. Storage and retrieval system. 3,697,680, Cl. 178-6.800.

Anthony, Russell W., to Lear Siegler, Inc. Expanding arbor. 3,697,092, Cl. 279-2.000.

Antonov, Vladimir Alexandrovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Aoki, Hidekatsu: *See—*
Terai, Akio; Kawamura, Eiji; Fukumoto, Hisashi; and Aoki, Hidekatsu, 3,696,879.

Apicella, Anthony M., Jr.; and Franks, John T., Jr., to Goodyear Aerospace Corporation. Polarity phasing of strap line for higher bit packing density of plated wire. 3,698,011, Cl. 340-174.0dc.

Appel, Sherman P., to Teletype Corporation. Droplet synchronization for electrostatic printing. 3,698,002, Cl. 346-1.000.

Aquaslide 'n' Dive Corporation: *See—*
Meyer, Carl R., 3,697,067.

Ardco, Inc.: *See—*
Winsler, Robert J.; and Richter, Fred A., 3,697,723.

Arganbright, Robert P., to Petro-Tex Chemical Corporation. Dismutation of olefins. 3,697,613, Cl. 260-683.00d.

Argoudelis, Alexander D.; Coats, John H.; and Pyke, Thomas R., to Upjohn Company, The. Lincomycin production. 3,697,380, Cl. 195-80.00r.

Armbruster, Jean-Claude: *See—*
Croissant, Pierre Michel Rene; Armbruster, Jean-Claude; and Chaumeau, Andree, 3,697,327.

Armour and Company: *See—*
Foltz, Thomas R.; Hegarty, Gerald R.; Hopkins, Ervin W.; and Wilcox, Joseph C., 3,696,662.
Rogers, Alan B.; and Sebring, Michael, 3,697,283.

Armstrong Cork Company: *See—*
Schluter, Wolfram, 3,696,571.

Armstrong, Gary E., to Metalines, Inc. Expansion joint cover. 3,696,575, Cl. 52-287.000.

Armstrong, Gilbert. Article delivery system. 3,696,890, Cl. 186-1.000.

Armstrong, James C. Speaker cabinet enclosure and method of tuning thereof. 3,696,886, Cl. 181-31.00b.

Arsenius, Torsten Henry, to SKF Industrial Trading and Development Company N.V. Hydraulic fluid throttling device. 3,696,841, Cl. 138-42.000.

Artama, Arvi. Furnace for heating and bending glass plates fo windshields and the like. 3,697,243, Cl. 65-273.000.

Arthur, Ralph P.: *See—*
Chadha, Rajendra N.; Arthur, Ralph P.; and Schweiker, George C., 3,697,489.

Arthur, Richard J., to Sperry Rand Corporation. Collision avoidance system. 3,697,987, Cl. 343-5.0em.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Fujimuto, Yoshihisa; Kimura, Yoshio; Terasaki, Iwao; and Kitago, Takanobu, 3,697,230.

Asai, Shojiro; Hirao, Motohisa; and Maruyama, Eiichi, to Hitachi, Ltd. Method of manufacturing semiconductor devices. 3,697,338, Cl. 148-188.000.

Asakawa, Kazuo; and Narita, Kaoru, to Japan Gas-Chemical Company, Inc. Method of producing trioxan. 3,697,546, Cl. 260-340.

Ashland Oil, Inc.: *See—*
Carpenter, David B.; and Thompson, Edward A., 3,697,414.

Assmus, Friedrich: *See—*
Ganter, Wolfgang; Assmus, Friedrich; and Sonntag, Manfred, 3,697,766.

Association de l'Ecole Catholique d'Arts et Metiers de Lyon: *See—*
Bousquet, Gilles; and Rambert , Andre, 3,696,446.

Athans, Jerry, Jr. Remotely controlled wall switch operating means. 3,697,905, Cl. 335-1.000.

Atkinson, Louis D.: *See—*
Bjornsen, Bjorn G.; and Atkinson, Louis D., 3,696,828.

Atkinson, Roger F.; Parr, Richard H., Jr; and Weil, Edward A., to Clendenin Investors Limited Partnership. Computer-alarm interface system. 3,697,984, Cl. 340-408.000.

Atlantic Richfield Company: *See—*
Tomezsko, Edward S. J., 3,697,614.
Yoo, Jin Sun; and Milam, Ronald L., 3,697,617.
Young, David W.; and Dieter, Jerry A., 3,697,250.

Atlas Copco Aktiebolag: *See—*
Jonsson, Nils Gunnar, 3,696,872.
Stenbacka, Johan Runar, 3,696,871.

Atwood Vacuum Machine Company: *See—*
Marx, Thomas O., 3,697,105.

Auberge Corporation: *See—*
De Van, William T.; and Van Dyck, Ken, 3,696,969.

Audac Corporation: *See—*
Kuehnle, Manfred R.; and Jochimsen, Dieter, 3,697,176.

Audretsch, Leo M., Jr.; and Elsner, Matthew, to International Business Machines Corporation. Communication by smooth high order composites of trigonometric product functions. 3,697,697, Cl. 179-15.0bc.

Aussant, Michel: *See—*
Meuleman, Johannes; and Aussant, Michel, 3,697,825.

Autechaud, Denis; and Grisard, Jean-Claude, to Societe de Fabrication d'Instruments de Mesure (SFIM). Method and apparatus for aircraft guidance. 3,697,022, Cl. 244-17.130.

Automated Building Components, Inc.: *See—*
Jureit, John Calvin, 3,696,572.

Automatic Control Systems, Inc.: *See—*
Weaver, Paul J., 3,697,040.

Automatic Switch Company: *See—*
Witkor, Dominik M., 3,697,709.

Avco Corporation: *See—*
Lucas, Joseph G.; and Zuryk, John, 3,697,401.
Webb, George, 3,696,544.

Avery Products Corporation: *See—*
Moore, John R.; Noack, William L.; and Roser, Robert A., 3,696,967.

Avins, Jack; and Craft, Jack, to RCA Corporation. Automatic frequency control circuits. 3,697,885, Cl. 331-8.000.

Ayad, Kamal Naguib: *See—*
Long, Frank; and Ayad, Kamal Naguib, 3,697,251.

Ayerst, McKenna and Harrison, Ltd.: *See—*
Lippmann, Wilbur, 3,697,654.

B&J Machinery Co., Inc.: *See—*
Cobble, James T., 3,697,013.

Bach, Hartwig C.; and Hinderer, Helmuth E., to Monsanto Company. Polyamides from pseudo-conjugated azo-aromatic diamines. 3,697,478, Cl. 260-47.0cz.

Bach, Nicholas J.; and Farkas, Eugene, to Lilly, Eli, and Company. Preparation of 17 alpha-ethynylestriol. 3,697,558, Cl. 260-397.500.

Bachmann, Gerhard: *See—*
Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, 3,697,461.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Dehnert, Johannes, 3,697,501.
Naarmann, Herbert; and Hartmann, Heinrich, 3,697,575.
Overwien, Hermann; and Mueller, Herbert, 3,697,580.
Reicheneder, Franz; Kropp, Rudolf; and Fischer, Adolf, 3,697,522.
Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, 3,697,461.

Bagland, Evan L., III; and Wagner, Robert L., to American Digital Corporation. Striking apparatus for rotating wheel printer. 3,696,739, Cl. 101-93.00c.

Bailey, James R.; Corbell, Paul I.; and Korta, Lawrence B., to Johnson Service Company. Intrusion detection apparatus having supervisory control means. 3,697,989, Cl. 343-5.0pd.

Baillard, Marcel, to Societe Nationale Industrielle Aerospatiale. Tools for plugging in and unplugging subsystems carried on slideways. 3,696,492, Cl. 29-203.00h.

Baker, Donal E., to Westinghouse Electric Corporation. DC static switch circuit with a main switch device and a power sharing circuit portion. 3,697,860, Cl. 323-9.000.

Baker Drapery Corporation: *See—*
Baker, George H., Sr., 3,697,035.

Baker, George H., Sr., to Baker Drapery Corporation. Drapery support. 3,697,035, Cl. 248-260.000.

Baker, Joseph W. Ball valve. 3,697,043, Cl. 251-315.000.

Balda-Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft: *See—*
Lange, Karl Heinz, 3,696,725.

Baldwin, D. H., Company: *See—*
Huggard, Leslie, 3,697,706.

Baldwin, Wiley M.; Fuchs, Edward O.; and Sharp, Donald J., said Baldwin and said Sharp assors. to Western Electric Company, Incorporated and said Fuchs and said Swisher assors. to Bell Telephone Laboratories, Incorporated. Scrap tantalum reclamation proces. 3,697,255, Cl. 75-.5ab.

Bales, Joseph H.; Prodger, Brian S.; and Ruppel, Kurt, to Mattel, Inc. Toy hill-climbing system. 3,696,555, Cl. 46-202.000.

Balicki, Stanley C. Cable-type lock assembly. 3,696,647, Cl. 70-49.000.

Balint, Laszlo J.; Lazarus, Stanley D.; and Russell, William N., to Allied Chemical Corporation. Method of esterifying a polycarboxylic acid with a glycol. 3,697,579, Cl. 260-468.00r.

Ball, Kenneth D.: *See—*
Gryctko, Carl E.; Strobel, Albert; and Ball, Kenneth D., 3,697,714.

Ballard, Edward C., to Du Pont de Nemours, E. I.,and Company. Ethylene/methyl methacrylate hot tack barrier coatings. 3,697,468, Cl. 260-28.5av.

Bally Manufacturing Corporation: *See—*
Tojza, Roman A.; and De Simone, Frank C., 3,696,905.

Balmer, Donald F.: *See—*
Kranyik, Robert Donald; Vegliante, Donald E.; and Balmer, Donald F., 3,696,524.

Balon Corporation: *See—*
Adams, Ladd M., 3,696,695.

Balzers Patent-und Beteiligungs-Aktiengesellschaft: *See—*
Zycha, Harald, 3,697,153.

Ban, Itsuki. Tape player utilizing plurality of endless magnetic tape cartridges. 3,697,083, Cl. 274-4.00f.

Ban, Itsuki. Programmed track selecting apparatus. 3,697,084, Cl. 274-4.00f.

Ban, Itsuki. Tape cartridge positioning apparatus. 3,697,085, Cl. 274-4.00b.

Banks, Howard F., to Corning Glass Works. Digital answerback circuit. 3,697,961, Cl. 340-172.500.

Bannister, Brian, to Upjohn Company, The. Lincomycin isothivuronium salts and process for preparing same. 3,697,503, Cl. 260-210.00r.

Baranowski, Karl F.; and Barrio, Alexander, Jr., to Omark Industries, Inc. Process for forming a saw chain cutter link. 3,696,692, Cl. 76-112.000.

Barber-Colman Company: *See—*
Olson, Raymond E.; and Yone, Harold R., 3,696,602.
Townsend, Franklin L., 3,696,477.

Barbier, Maurice, to Societe Nationale des Petroles d'Aquitaine Tour Aquitaine. Process for measuring the sampled amplitude of a seismic signal. 3,698,009, Cl. 340-155.0cp.

Barecki, Chester J.; and Schneider, Kenneth O., to American Seating Company. Connector assembly for chairs. 3,697,130, Cl. 297-248.000.

Bareis, Alfred: *See—*
Bergmann, Ewald; and Bareis, Alfred, 3,696,983.

Barenyi, Bela: *See—*
Wilfert, Karl; and Barenyi, Bela, 3,697,097.

Barh, Alfred: *See—*
Hossmann, Marcell; and Barh, Alfred, 3,698,013.

Barnett, Robert D.: *See—*
Fowler, John H.; and Barnett, Robert D., 3,696,831.

Barrio, Alexander, Jr.: *See—*
Baranowski, Karl F.; and Barrio, Alexander, Jr., 3,696,692.

Barron, Roger L., to Adaptronics, Inc. Self-organizing control. 3,697,957, Cl. 340-172.500.

Bartholomew, Gerald E.; Kostuch, Donald J.; Robinson, Thomas E.; and Rohland, William S., to International Business Machines Corporation. Pattern recognition by multiple associative transformations. 3,697,951, Cl. 340-146.30q.

Basalaev, Anany Maximovich: *See—*
Frolov, Jury Fedorovich; Nechaev, Ivan Petrovich; Basalaev, Anany Maximovich; Bedarev, Jury Dmitrievich; and Golikov, Viktor Valerjanovich, 3,697,660.

BASF Wyandotte Corporation: *See—*
Damusis, Adolfas, 3,697,483.

Batchelder, Charles F.; and Rubico, Jerome A., to Batchelder, Rubico, Inc. Process for locked shoe construction. 3,696,455, Cl. 12-145.000.

Batchelder, Rubico, Inc.: *See—*
Batchelder, Charles F.; and Rubico, Jerome A., 3,696,455.

Batzill, Wolfgang: *See—*
Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, 3,697,461.

Baude, John, to Isotopes, Inc., mesne. Purge control for fuel cell. 3,697,325, Cl. 136-86.00b.

Bauer, Leo, to Sperry Rand Corporation. Power transmission. 3,696,836, Cl. 137-625.250.

Baughman, James R.: *See—*
United States of America, National Aeronautics and Space Administration, 3,696,833.

Baumer, Wilhelm: *See—*
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,697,225.

Bayne, John; King, Ian Robert; and Morey, John Richard, to Laporte Industries Limited. Vapour phase oxidation of benzene to maleic anhydride using an aluminum phosphate supported catalyst. 3,697,550, Cl. 260-346.800.

Beach, Kenneth M., Jr.: *See—*
Maksymiak, John; Beach, Kenneth M., Jr.; and Smith, James W., 3,697,169.

Beam, Norman: *See—*
Beasley, Silas V.; and Beam, Norman, 3,696,734.

Beard, Terry D.; and Garen, Eric R. Stereoscopic television system. 3,697,675, Cl. 178-6.500.

Beasley, Silas V.; and Beam, Norman, to McGraw-Edison Company. Commercial waffle baker. 3,696,734, Cl. 99-331.000.

Beatrice Foods Company: *See—*
Gore, William C.; and Shapiro, Eugene B., 3,696,639.

Beausoleil, William F.; Ho, Irving T.; Jen, Teh-Sen; and Pricer, W. David, to International Business Machines Corporation. Two device monolithic bipolar memory array. 3,697,962, Cl. 340-173.00r.

Beaver, David J.: *See—*
Stoffel, Paul J.; and Beaver, David J., 3,697,252.

Bechler, Andre. Bar feed for automatic lathe. 3,696,696, Cl. 82-.50.

Beck, Alfred B., to TRW Inc. Impedance transforming binary hybrid trees. 3,697,895, Cl. 333-8.000.

Beck, Dr., & Co., GmbH: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,697,471.

Beck, Hans-Joachim: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,697,471.

Beckman Instruments, Inc.: *See—*
Ehret, Robert J., 3,697,820.

Bedarev, Jury Dmitrievich: *See—*
Frolov, Jury Fedorovich; Nechaev, Ivan Petrovich; Basalaev, Anany Maximovich; Bedarev, Jury Dmitrievich; and Golikov, Viktor Valerjanovich, 3,697,660.

Beech-Nut, Inc.: *See—*
Hoffman, Louis S.; and Spruyt, Harry, 3,696,940.

Beeley, Michael G.; and Thompson, Richard D., to McGraw-Edison Company. Steam air garment finisher. 3,696,523, Cl. 34-216.000.

Beerbower, Alan: *See—*
Garabrant, Arthur R.; Beerbower, Alan; and Wilson, James A., 3,696,661.

Beeskow, Bruno, to Daimler-Benz Aktiengesellschaft. Intermediate support for the universal joint shaft of motor vehicles. 3,697,144, Cl. 308-15.000.

Beffa, Fabio: *See—*
Ackermann, Hans; and Beffa, Fabio, 3,697,500.

Behnke, Kenneth P.: *See—*
Mackal, Henry H.; and Behnke, Kenneth P., 3,696,494.

Belcher, Richard A.; and Kozacka, Frederick J., to Chase-Shawmut Company, The. Electric low-voltage fuse. 3,697,916, Cl. 337-161.000.

Bell & Howell Company: *See—*
Dann, Bert H., 3,697,673.
Hartmann, Rudolf, 3,696,724.
Mateja, Eugene V., 3,697,158.

Bell, AlanEngland, to Foster Wheeler Corporation. Steam boilers. 3,696,793, Cl. 122-4.00d.

Bell Telephone Laboratories, Incorporated: *See—*
Aaron, Marvin Robert; Hammett, Warren Gail; and Oberst, James Francis, 3,697,690.
Baldwin, Wiley M.; Fuchs, Edward O.; and Sharp, Donald J. (said Fuchs and said Swisher assors. to), 3,697,255.
Berg, Anthony David, 3,697,682.
Casey, Horace Craig, Jr.; and van Roosbroeck, Willy Werner, 3,697,834.
Chang, Robert Wu-Lin, 3,697,897.
Danielmeyer, Hans Guenter, 3,697,888.
Greason, William Wallace, III; and Weiner, David William, 3,697,700.
Greason, William Wallace, III; and Weiner, David William, 3,697,701.
Jacisin, Joseph Michael; and Tropello, Sam Duane, 3,697,089.
Kish, Donald Eugene; and Smith, James Lanson, 3,697,963.
Lawrence, Thomas R.; and Saltzberg, Burton R., 3,697,892.
Leifer, Noel Arthur; and Ott, Henry Walter, 3,697,016.
Smith, George Elwood, 3,697,786.
Stone, Julian, 3,697,757.

Belleson, James Garman, to International Business Machines Corporation. Method and system for selective display of images from a video buffer. 3,697,678, Cl. 178-6.6dd.

Bellis, Harold Edward, to Du Pont de Nemours, E. I., and Company. Electroless gold plating bath and process. 3,697,296, Cl. 106-1.000.

Bellis, Harold Edward, to Du Pont de Nemours, E. I., and Company. Dechlorination process. 3,697,608, Cl. 260-653.500.

Bendix Corporation, The: *See—*
Elliott, Delbert R.; and Lewis, William T., 3,697,139.
Faris, William R.; and Harokopus, William P., 3,697,985.

Benenati, Salvatore: *See—*
Kanbar, Maurice S.; and Benenati, Salvatore, 3,697,036.

Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., to United States of America, Agriculture. Fire resistant organic products and method for production. 3,697,316, Cl. 117-136.000.

Benjamin, John Stanwood, to International Nickel Company, Inc., The. Stainless steels by powder metallurgy. 3,696,486, Cl. 29-182.500.

Bennett, John D., to Sun Oil Company (Delaware). Bucket wheel ice cutter. 3,696,624, Cl. 61-46.000.

Bennett, Raymond G.; and Luedi, Mark, to Novo Industrial Corporation-United Air Cleaner Division. Air cleaner with improved unloading apparatus. 3,696,591, Cl. 55-337.000.

Benson, Marshall, to Xerox Corporation. Xerographic development apparatus. 3,696,784, Cl. 118-637.000.

Benzoni, Luigi: *See—*
Pasquino, Pietro; Benzoni, Luigi; Carnisio, Giuseppe; and Colombo, Luigi, 3,697,578.

Berardi, Michael P. Electrical musical stringed instruments. 3,696,700, Cl. 84-291.000.

Berenson, Herman; Stonier, Robert Alden; and Wiese, Eugene Everett, to American Cyanamid Company. Germicidal detergent compositions in controlling dandruff. 3,697,655, Cl. 424-204.000.

Beresic, John I. Hopper material supply indicator. 3,697,708, Cl. 200-61.210.

Berezin, Gilbert H., to Du Pont de Nemours, E. I., and Company. 2-Aminomethyl-2-adamantanol. 3,697,593, Cl. 260-563.00p.

Berg, Anthony David, to Bell Telephone Laboratories, Incorporated. Video signal processing. 3,697,682, Cl. 178-6.800.

Berg, Arthur A.; and Klimek, Boleslaw, to Berg Manufacturing Company, The, mesne. Roll diaphragm brake. 3,696,711, Cl. 92-48.000.

Berg Electronics, Inc.: *See—*
Black, Richard W.; and Evans, Robert F., 3,697,933.

Berg Manufacturing Company, The, mesne: *See—*
Berg, Arthur A.; and Klimek, Boleslaw, 3,696,711.

Berg, Rudolph G.: *See—*
Tate, Bryce E.; and Berg, Rudolph G., 3,697,453.

Berger, James K., to Pioneer Magnetics, Inc. Regulated DC-DC power supply. 3,697,854, Cl. 321-2.000.

Berglund, Harold A.; and Thomas, David F., to Waterous Company. Ice cream pump. 3,697,197, Cl. 417-360.000.

Bergmann, Ewald; and Bareis, Alfred, to Schuler, L., GmbH. Roll feed for strip-or-band-shaped work-pieces, especially at quick-motion presses. 3,696,983, Cl. 226-141.000.

Bergson, Arnold A.: *See—*
Stevens, Alan F.; and Bergson, Arnold A., 3,697,973.

Beringer, Monique: *See—*
Buchmann, Paul; and Beringer, Monique, 3,696,816.

Berka, Bohdan Jiri. Signalling system for bore logging. 3,697,940, Cl. 340-18.00r.

Berkey/Colortran, Inc.: *See—*
Glickman, Richard B.; and Hartz, George R., 3,697,031.

Berman, Paul A., to Westinghouse Electric Corporation. Fuel pump system for gas turbines. 3,696,612, Cl. 60-39.140.

Bernatschek, Adolf Oswald. Braking shuttle box. 3,696,844, Cl. 139-186.000.

Bernewasser, Horst, to Kochs Adler AG. Apparatus for trimming and clipping the edges of textile fabric cuts. 3,696,765, Cl. 112-121.120.

Bernhard Beyschlag Apparatebau G.m.b.H.: *See—*
Dull, Helmut, 3,697,816.

Bernold, Jean P.; and Pfeiffer, Hans Walter. Prefabricated reinforced concrete plate shaped construction element. 3,696,577, Cl. 52-583.000.

Bernstein, Karl; and Walter, E Richard, to Safety Signaling, Inc., mesne. Remotely controlled switching system. 3,697,975, Cl. 340-310.000.

Berry, Clyde A., to Pilot Research Corporation. Panty hose. 3,696,444, Cl. 2-224.00r.

Berry, Thomas F.: *See—*
Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., 3,696,500.

Berry, Thomas G., to Fairchild Hiller Corporation. Collapsible, extendible double tubular structure. 3,696,568, Cl. 52-108.000.

Berstorff, Hermann, Maschinenbau GmbH: *See—*
Anders, Dietmar, 3,696,913.

Besser Company: *See—*
Bobolts, Leroy F., 3,696,945.

Beta Instrument Company Limited: *See—*
Kyriakis, John; and Tole, Walter Roland, 3,697,335.

Bethlehem Steel Corporation: *See—*
Miller, Francis G., 3,696,923.
Murray, Robert H., 3,697,134.

Bettinardi, Edward Robert, to Johns-Manville Corporation. Catalytic oxidation unit comprising a fluid permeable body of fibrous admixture. 3,697,447, Cl. 252-458.000.

Betts, Anson G. Recovery of sulphur dioxide (SO2) from gas streams and precipitation of aluminum fluorine product. 3,697,248, Cl. 71-38.00.

Betz Laboratories, Inc.: *See—*
Lieberman, Hillel, 3,697,438.
Lieberman, Hillel; Duharte-Francia, Carlos A.; and Henderson, John W., 3,697,439.
Lieberman, Hillel, 3,697,442.

Beverett, James H. Automatic dripolator, single compartment. 3,696,733, Cl. 99-307.000.

Beyleveld, Wilhelmus M.; Oxenrider, Bryce C.; and Woolf, Cyril, to Allied Chemical Corporation. Novel fluorocarbon diamides. 3,697,562, Cl. 260-404.500.

Bhagat, Gopal C.; and Randall, John M., to Xerox Corporation. Automatic duplexing apparatus. 3,697,170, Cl. 355-17.000.

Bhaskaran Nair, Padinjarai-Madom Narayanan Nair. Device for holding down the rail to the sleeper in a railway track. 3,696,998, Cl. 238-349.000.

Bhuta, Mahendra; and Sacks, William, to Allied Chemical Corporation. Polyamide-polyethylene composite films. 3,697,368, Cl. 161-227.000.

Bialous, Charles A.; Campbell, Allen J.; and Liberti, Frank N., to General Electric Company. Chromanyl terminated polycarbonate. 3,697,481, Cl. 260-47.0xa.

Bickel, Hans: *See—*
Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, 3,697,515.

Bielefeldt, Irvin P., to Alco Standard Corporation. Heating apparatus with removable heating elements and shields. 3,697,725, Cl. 219-388.000.

Biet, Jean: *See—*
Leblond, Jean; and Biet, Jean, 3,696,949.

Biet, Jean-Pierre; Nguyen, Quang Tan; Peres, Gerard; and Ripoche, Gerard, to Compagnie Generale d'Electricite. Optical-electrical movement detector utilizing staggered rows photo detectors and logic for determining the location of a luminous spot. 3,697,76, Cl. 250-209.000.

Bilhorn, John M., to ESB Incorporated. Duplex electrode construction using continuous metal carrier strip coated on one side with conductive adhesive. 3,697,328, Cl. 136-175.000.

Binks, Melvin J. Pinhole detector with internal light shield assembly. 3,697,758, Cl. 250-202.000.

Bishop, Irving N.; Mosher, Richard G.; and Simko, Aladar O., to Ford Motor Company. Combustion process for engine of spark ignition, fuel injection type. 3,696,798, Cl. 123-32.0st.

Bissell, George H.: *See—*
Kleptz, James A.; and Bissell, George H., 3,697,992.

Bitko, Sheldon S., to Fifth Dimension, Inc. Mercury switch. 3,697,906, Cl. 335-58.000.

Bixler, William L.; and Voss, Harold C., to Gates Rubber Company, The. Belt measuring device. 3,696,511, Cl. 33-125.00r.

Bjornsen, Bjorn G.; and Atkinson, Louis D., to Johnson Service Company. Common supply for opposing jet fluidic device. 3,696,828, Cl. 137-81.500.

Blachier, Bruno L.; and Champeau, Andre R., to Communications Satellite Corporation. Plural cavity bandpass waveguide filter. 3,697,898, Cl. 333-21.00a.

Black, Richard W.; and Evans, Robert F., to Berg Electronics, Inc. Connector block. 3,697,933, Cl. 339-192.00r.

Black, William Raymond, to Borden Company, The. Urea-aldehyde resin adhesive process. 3,697,355, Cl. 156-319.000.

Blackwood, James O.; and Cullis, Brian D., to Commonwealth Scientific and Industrial Research Organization. Production of carbon tetrachloride. 3,697,610, Cl. 260-664.000.

Blaisdell, Donald Stapf; and Klaas, Ruth Elizabeth Barry. Method and apparatus for treatment of aqueous liquor. 3,697,420, Cl. 210-42.000.

Blaschke, Franz: *See—*
Schade, Gerhard; and Blaschke, Franz, 3,697,480.

Blecher, Stephen, to Honeywell Inc. Circular tray support and indexing apparatus. 3,697,161, Cl. 353-117.000.

Bleiche AG: *See—*
Stritzko, Vilem, 3,697,314.

Block Engineering, Inc.: *See—*
Hirschfeld, Tomas; and Matsu, Noboru, 3,697,226.

Blomgren, Oscar C., Jr., to Inter-Probe, Inc. Electrostatic fuel filter. 3,697,411, Cl. 204-302.000.

Blumcraft of Pittsburgh, Pa.: *See—*
Horgan, William J., Jr., 3,696,648.

Blumenberg, Horst H.; and Francillon, Francis W., to Kentucky Electronics Inc. Assembly jig for miniature electrostatically deflected cathode ray tubes. 3,696,491, Cl. 29-203.00j.

Blumenkamp, Manfred. Textile article dyeing apparatus. 3,696,644, Cl. 68-15.000.

Blundell, Ian: *See—*
Harris, Albert Edward; and Blundell, Ian, 3,697,278.

Bobard, Emile. Removable positionable vehicle control center. 3,696,880, Cl. 180-77.00r.

Bobolts, Leroy F., to Besser Company. Block cubing apparatus. 3,696,945, Cl. 214-6.00g.

Bobrick, Mitchell, to Air King Corporation. Trim ring for architectural light including means for stepped rotational and axial adjustment. 3,697,742, Cl. 240-78.0ha.

Bodem, Johann: *See—*
Schedler, Wolfgang; and Bodem, Johann, 3,696,707.

Bodenheimer, Bert A., to Sea-Land Service, Inc. Bulk cargo handling system and method. 3,696,952, Cl. 214-314.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Matejka, Edgar, 3,697,776.

Boen Bruk: *See—*
Olsen, Leif Thorvald, 3,697,361.

Boertje, Arie Leendert; and Philpott, Peter John, to Lever Brothers Company. Apparatus for frying food pieces. 3,696,735, Cl. 99-404.000.

Bohn, Karl A. Band iron stock working tool with a twist device thereon. 3,696,654, Cl. 72-299.000.

Boinodiris, Stavros; and Hellwarth, George A., to International Business Machines Corporation. Isolated digital-to-analog converter. 3,697,980, Cl. 340-347.0da.

Boisen, Christian K. F.; deceased (by Boisen, Karen V.; administratrix), to Steiner Company Lausanne S.A. Paper towel dispenser. 3,697,146, Cl. 312-39.000.

Boisen, Karen V.: *See—*
Boisen, Christian K. F., 3,697,146.

Boissevain, Mathew G.; and Hill, Robert C., to Measurex Corporation. Enclosure with radiation source having fail safe shutter. 3,697,755, Cl. 250-106.00s.

Boissier, Jacques R.; and Ratouis, Roger, to Societe Anonyme dite: Roussel-UCLAF. Phenylacetic acids and their salts. 3,697,590, Cl. 260-518.00r.

Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, to Rhone-Poulenc S.A. Iminoxyorganosilanes. 3,697,568, Cl. 260-448.80r.

Bolton, Norman A., to General Signal Corporation. Flux nulled wheel detector. 3,697,745, Cl. 246-249.000.

Bonagura, Ronald: *See—*
Lysle, Gordon; and Bonagura, Ronald, 3,696,722.

Bonazzi, Pericle. Press for rebuilding of tires. 3,697,206, Cl. 425-20.000.

Bonilla, Charles F., 90% to Haskett, Barry F. and 10% to Martin, Joan Hixon. Purification of impure solid NaCl by countes-current contact with molten NaCl. 3,697,234, Cl. 23-312.0ah.

Bonner, Charles W., Jr.; and Houck, Curtis T., to Cardwell Machine Company, The. Tobacco threshing machine. 3,696,817, Cl. 131-145.000.

Boocock, David: *See—*
Newman, Michael; and Boocock, David, 3,696,757.

Boocock, David G. B.; and Ullman, Edwin F., to Synvar Associates. 2,4,5-Substituted N-oxy and hydroxyimidazoles. 3,697,538, Cl. 260-309.000.

Boogert, Lucas W. P.: *See—*
Fehres, Hans; and Boogert, Lucas W. P., 3,696,962.

Booth, Llewellyn Delphin, to Dow Chemical Company, The. Process for polymerizing episulfides. 3,697,488, Cl. 260-79.700.

Booth, Thomas A., to Addressograph-Multigraph Corporation. Illuminating system for a copying machine. 3,697,177, Cl. 355-67.000.

Booth, William C.; and Kyser, Leslie T., to Singer Company, The, mesne. Digital computer utilizing a plurality of parallel asynchronous arithmetic units. 3,697,734, Cl. 235-164.000.

Borden Company, The: *See—*
Black, William Raymond, 3,697,355.

Borden Inc.: *See—*
Erekson, Arthur B.; and Lane, Lamcolm S., 3,696,847.

Borg-Warner Corporation: *See—*
Chadha, Rajendra N.; Arthur, Ralph P.; and Schweiker, George C., 3,697,489.
Geils, Alfred E.; Raymond, William J.; Roberts, Richard W.; and Shreck, Peter K., 3,697,162.

Borjeson, Jan Lennart, to Aktiebolaget Bofors. Target tracking sight. 3,697,848, Cl. 318-649.000.

Boro, William B., to Fairchild Industries, Inc. Hand tool for reaching remote locations. 3,696,694, Cl. 81-57.260.

Borschevsky, Igor Konstantinovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Bosch, Robert, G.m.b.H.: *See—*
Christ, Klaus H., 3,697,807.
Schjlz, Jurgen, 3,697,872.

Bossen, Douglas C., to International Business Machines Corporation. Apparatus for correcting two groups of multiple errors. 3,697,948, Cl. 340-146.1al.

Bosshardt, Rolf: *See—*
Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, 3,697,515.

Bosten, Donald R.; and Rusnak, Michael, to Rockwell Manufacturing Company. Impact wrench. 3,696,693, Cl. 81-52.30.

Boucourt, Robert; Nedelec, Lucien; and Gasc, Jean-Claude, to Roussel-UCLAF. Preparation of 7α-methyl steroids. 3,697,556, Cl. 260-397.450.

Bourg, Michel, to Frankel-Industries. Conveyor system. 3,696,752, Cl. 104-148.

Boursin, Rene A., to Sovcor Electronique. Encapsulated cardwood type electronic or electrical component assembly. 3,697,818, Cl. 317/101/0cw.

Bousquet, Gilles; and Rambert , Andre, to Association de l'Ecole Catholique d'Arts et Metiers de Lyon. Total knee prosthesis. 3,696,446, Cl. 3-7.000.

Boustany, Kamel; and Coran, Aubert Yaucher, to Monsanto Company. Discontinuous cellulose reinforced elastomer. 3,697,364, Cl. 161-59.000.

Boyd, David M.; and Gerhold, Clarence G., to Universal Oil Products Company. Control system for an engine system. 3,696,618, Cl. 60-276.000.

Brady, Donnie G.: *See—*
Cardenas, Carlos G.; and Brady, Donnie G., 3,697,607.

Brady, Jack C.; and Fewel, Kenneth J., to United States of America, Navy, mesne. Acceleration sensitive shock absorber valve. 3,696,894, Cl. 188-275.000.

Braithwaite, David G., to Nalco Chemical Company. Catalyst coating method. 3,697,446, Cl. 252-455.00z.

Brake, Cecil Clifford, to Scovill Manufacturing Company. Air line lubricator. 3,696,889, Cl. 184-55.00a.
Brake, Loren D., to Du Pont De Nemours, E. I., and Company. Alkali moderation of supported ruthenium catalysts. 3,697,449, Cl. 252-474.000.
Brand, Wilhelmus K.: *See—*
Van Nassau, Petrus J. M.; Brand, Wilhelmus K.; and Kaasenbrood, Petrus J. C., 3,697,521.
Brandell, John R., to Brandell Products Corporation. Golf putting practice device. 3,697,079, Cl. 273-179.00a.
Brandell Products Corporation: *See—*
Brandell, John R., 3,697,079.
Brandenberger, Fred L. Combination portable fire escape and wardrobe support. 3,696,888, Cl. 182-35.000.
Branson Instruments, Incorporated: *See—*
Obeda, Edward G., 3,697,357.
Brashear, Hugh R., Jr.: *See—*
Acree, Elick H.; Brashear, Hugh R., Jr.; and Case, Forrest N., 3,697,756.
Brassard, Theodore, to Texas Instruments, Incorporated. Circuit breaker having means for increasing current carrying capacity. 3,697,915, Cl. 337-74.000.
Braun Aktiengesellschaft: *See—*
Messinger, Werner, 3,696,508.
Braun, Martin; Grossel, Stanley S.; and Singer, Barry M., to Machlett Laboratories, Incorporated, The. Image intensifier tube having a multi-radius photocathode. 3,697,795, Cl. 313-102.000.
Braunstein, David M., to Celase Corporation. Diisocyanate coupling of oxymethylene polymer and polybutylene terephthalate. 3,697,624, Cl. 260-860.000.
Braverman, Leslie, to Solo Products Corporation. Hanger bracket for merchandise. 3,696,937, Cl. 211-54.000.
Breed, Charles P.; and Anderson, Melvin R., to Westinghouse Electric Corporation. Area lighting luminaire. 3,697,740, Cl. 240-46.370.
Breidenstein, Kenneth R., to Kraftco Corporation. Method of making cottage cheese. 3,697,293, Cl. 99-116.000.
Brejcha, Robert J.; and Corbett, William H., to Everpure, Inc. Test plug for filter assembly. 3,696,669, Cl. 73-168.000.
Brenneisen, Paul: *See—*
Paltauf, Fritz; Margot, Alfred; and Brenneisen, Paul, 3,697,555.
Brenneke, Arthur M., to TRW Inc. Plastics filled piston ring. 3,697,090, Cl. 277-157.000.
Brenner, Leonard C., to Burroughs Corporation. Digitally nulled magnetic detection system. 3,697,870, Cl. 324-43.00r.
Bressickello, Tony J. Humidified and refrigerated showcase. 3,696,630, Cl. 62-188.000.
Brewington, Doyle W., to Ward, V. F., mesne. Intermittent problem alarm for electronic equipment based on a CRT image. 3,697,674, Cl. 178-5.45e.
Bridgestone Tire Company Limited: *See—*
Watanabe, Tetsuo; Oikawa, Akira; and Masayoshi, Kuroda, 3,696,854.
Brimhall, Ray S.; deceased (by Walker Bank and Trust Co.; administrator). Method of processing oil shale. 3,697,412, Cl. 208-11.000.
Brinkman, Dale U. Operably aligned and clamped earth boring machine. 3,696,874, Cl. 175-122.000.
Bristol, John E., to Du Pont de Nemours, E. I., and Company. Preparation of polyvinyl alcohol having improve color properties by treating the polyvinyl ester with ozone. 3,697,495, Cl. 260-91.3pv.
Bristol-Myers Company: *See—*
Jensen, Erik Kjaer, 3,696,819.
British Domestic Appliances Limited: *See—*
Nethersell, Barry Herbert, 3,696,903.
British Petroleum Company Limited, The: *See—*
Byford, Derek Clark; and Silver, Howard Bernard, 3,697,427.
British Railways Board: *See—*
Newman, Michael; and Boocock, David, 3,696,757.
Brokke, Mervin E., to Stauffer Chemical Company. Composition of matter. 3,697,536, Cl. 260-302.00r.
Bronstein, Leonard. Method and product of making multifocal contact lenses and lens blanks. 3,697,629, Cl. 264-1.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Torii, Masaru, 3,696,768.
Brouchu, Rene Robert; and Taylor, Lytton, to American Cyanamid Company. Process for bonding two solid articles together in which a catalyzed unsaturated polyester resin is used in combination with a promoted unsaturated polyester resin. 3,697,353, Cl. 156310.000.
Brown, Dwight C. Dual purpose nesting pallets. 3,696,761, Cl. 108-53.000.
Brown, Fred A., III; and Le Mere, Roger, to Cluett, Peabody & Co., Inc. Stay fusing machine. 3,697,354, Cl. 156-380.000.
Brown, George T., Jr.; and Clark, Donald B., to National Cash Register Company, The. Pressure-sensitive record material. 3,697,323, Cl. 117-234.000.
Brown International Corporation: *See—*
Rickard, Donn J., 3,696,584.
Brown, Joseph Patrick, to Monsanto Chemicals Limited. Insecticidal method using 3-methylenedioxy-phenyl substituted rhodanials. 3,697,656, Cl. 424-270.000.
Brown, Melancthon S., to Chevron Research Company. N-Polyhalovinylthioformamides. 3,697,571, Cl. 260-453.00r.
Brown, Melancthon S., to Chevron Research Company. N-aryl-N'alkyl-N'arylthio ureas as herbicides. 3,697,572, Cl. 260-453.00r.
Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., to Brunswick Corporation. Metal flocking. 3,697,238, Cl. 29-191.200.
Brown, Roberty E.: *See—*
Novak, David M.; and Brown, Roberty E., 3,697,739.
Brown, Roger S.: *See—*
Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,603.
Mayer, Mayer, Jr.; Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,600.
Brown, Walter, to Subsea Equipment Associates Limited. Undersea riser structure. 3,696,864, Cl. 166-.500.
Brown, Yull. Metal detection and alarm systems. 3,697,972, Cl. 340-258.00r.
Browning, Gordon D.: *See—*
Day, Alan M.; and Browning, Gordon D., 3,697,289.
Browning, William C.; and Chesser, Billy G., to Milchem Incorporated. Composition and process for cross-linking modified carbohydrates with chrome sulfate and lignin. 3,697,498, Cl. 260-124.00r.
Bruckner-Apparatebau Michelstadt GmbH: *See—*
Schuierer, Manfred, 3,696,643.
Bruhns, Robert. Purple martin bird house. 3,696,792, Cl. 119-23.000.
Brunswick Corporation: *See—*
Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., 3,697,238.
Bryant, Clifford F., 50% to White, Albert. Educational toy. 3,696,530, Cl. 35-28.000.
Bryant, Gerald T.; Linhardt, Hans D.; and Nichols, Kenneth E., to Airco, Inc. Submerged pump removal system. 3,696,975, Cl. 222-333.000.
Bryden, Joseph E.; and Chambers, Derek, to Raytheon Company. Visula display system. 3,697,955, Cl. 340-172.500.
Brzykcy, Jerome J. Combination sawhorse, scaffold support and table. 3,696,887, Cl. 182-28.000.
Bschorer, Konrad, to Friedrich Deckel Prazisions Mechanik und Maschinenbau. Hydraulic control valve having laterally and rotationally displaceable valve plate. 3,697,041, Cl. 251-3.000.
Buchmann, Paul; and Beringer, Monique, to Tamag Basel A.G. Stirrer-crusher mill for the continuous manufacture of a tobacco mash. 3,696,816, Cl. 131-133.00r.
Buck, Robert W.: *See—*
Moss, James R.; Roe, Richard R.; Coubrough, Lawrence E.; and Buck, Robert W., 3,697,836.
Bucourt, Robert; Nedelec, Lucien; Gasc, Jean-Claude; and Pierdet, Andre, to Roussel-UCLAF. Novel preparation of pregnanes. 3,697,510, Cl. 260-239.55r.
Bucourt, Robert; and Nedelec, Lucien, to Roussel-UCLAF. Novel process for producing 10-hydrocarbon-19-nor-steroids. 3,697,511, Cl. 260-239.55r.
Buczek, Carl J.: *See—*
Skolnick, Michael L.; and Buczek, Carl J., 3,697,151.
Bugaut, Andrec: *See—*
Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, 3,697,215.
Buhle, Emmett L.: *See—*
Buzby, George C., Jr.; Greenspan, George; and Buhle, Emmett L., 3,697,379.
Bull, James R.: *See—*
Oswald, Robert A.; and Bull, James R., 3,697,698.
Bulman, E. O., Manufacturing Co., Inc., The: *See—*
Waltz, Edward, 3,696,980.
Bunker, James F.; Poland, James E.; Sayell, Emerson H.; and Schmidt, George V., to United States of America, Atomic Energy Commission. Radioisotope heat source system. 3,697,329, Cl. 136-202.000.
Bunker-Ramo Corporation: *See—*
Hammond, Peter George Henry, 3,697,922.
Bunker-Ramo Corporation, The: *See—*
Dinerstein, Samuel, 3,696,607.
Konewko, Joseph E.; and Occhipinti, Carl, 3,697,929.
Bunnell, Douglas E.; and Walker, Douglas J., to Whirlpool Corporation. Multiple compartment dispenser for a laundry appliance. 3,696,970, Cl. 222-145.000.
Buonsante, John J.; Freericks, Lambert; Haarmann, Howard J.; and Sieglinger, John C., to American Telephone and Telegraph Company. Selectably controllable announcement system. 3,697,702, Cl. 179-18.00b.
Burba, Christian; Drawert, Manfred; Voigt, Hartmut; and Griebsch, Eugen. Polyurethane foam. 3,697,458, Cl. 260-2.5aq.
Burges, Luther M.: *See—*
Synstad, Alvin R.; Burges, Luther M.; and Day, Paul P., 3,696,495.
Burgess, George A.: *See—*
Reckseit, Bernard S.; and Burgess, George A., 3,697,006.
Burk, Charles R., to Textron, Inc. Method and apparatus for finishing an antifriction-bearing raceway. 3,696,483, Cl. 29-90.000.
Burkard, Edward A.: *See—*
Harlock, George H.; and Burkard, Edward A., 3,697,366.
Burkhardt, Gottfried, to Diehl. Calculating mechanism for ten keys-four species-calculating machines. 3,696,994, Cl. 235-60.00r.
Burroughs Corporation: *See—*
Brenner, Leonard C., 3,697,870.
Hanson, Lawrence G., 3,697,735.
Hunter, James R.; Dinerman, Bernard B.; Mann, Abe; and Schroeder, Franklin T., 3,696,946.
Burroughs Wellcome Co.: *See—*

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., 3,697,512.
Burtin, James D., to Detroit Tool and Engineering Company. Rivet bucking assembly and method. 3,696,501, Cl. 29-509.000.
Busch, Georg; and Wachter, Peter, to Verein zur Forderung der Festkorperphysik an der Edgenossischen Technischen Hochschule. Device for producing multi-color television images by magnetic field control of a particular luminescent screen. 3,697,688, Cl. 1785.40r.
Busch, Walter; Kramer, Heinz; Lind, Erwin; and Messner, Dieter, to Kalle Aktiengesellschaft. Process for coating the surface of a material. 3,697,303, Cl. 117-37.0le.
Buss A.G.: *See—*
Munch, Hans Joachim, 3,697,387.
Butler, James L. Rotary engine. 3,697,203, Cl. 418-173.000.
Butler, Kenneth, to Pfizer Inc. Crystalline alkali metal salts of α-carboxybenzylpenicillin and process therefor. 3,697,506, Cl. 260-239.100.
Butter, Karl, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and arrangement for installing measuring feelers. 3,696,676, Cl. 73-343.00r.
Butter, Karl; and Wittich, Willibald, to Messerschmitt Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Apparatus for partial electroplating including an electroplating head. 3,697,405, Cl. 204-275.000.
Buzby, George C., Jr.; Greenspan, George; and Buhle, Emmett L., to American Home Products Corporation. Asymmetric reduction of seco-steroids. 3,697,379, Cl. 195-51.00r.
Byford, Derek Clark; and Silver, Howard Bernard, to British Petroleum Company Limited, The. Lubricants having improved anti-wear and anti-corrosion properties. 3,697,427, Cl. 252-49.900.
C & M Manufacturing Company, Inc., mesne: *See—*
Weisker, Alexander; and Smith, Raymond L., Jr., 3,696,954.
Cadiou, Jean, to Ste'An Automobiles Citroen. Arrangement for securing a container to a vehicle. 3,697,093, Cl. 280-5.00a.
Cahill, Richard H.: *See—*
Sullivan, Charles I.; and Cahill, Richard H., 3,697,466.
Caldwell, John W.; and Smith, Edward M., to Teledyne, Inc. Traveling-wave tube package with integral voltage regulation circuit for remote power supply. 3,697,799, Cl. 315-3.500.
California Institute of Technology: *See—*
Holt, Norman I., 3,697,705.
Calvi, Salvatore J.: *See—*
Morriston, Douglas I.; and Calvi, Salvatore J., 3,697,165.
Campbell, Allen J.: *See—*
Bialous, Charles A.; Campbell, Allen J.; and Liberti, Frank N., 3,697,481.
Campbell, Erwin A., to Moore, Lee C., Corporation. Pipe handling apparatus. 3,696,944, Cl. 214-2.500.
Campbell, Hugh W., to National Cash Register Company, The. Self-destructible molded articles. 3,697,668, Cl. 174-68.500.
Campbell, Millford A. Work feeding track for T-shaped parts. 3,696,904, Cl. 198-43.00r.
Canadian Marcons Company: *See—*
El-Banna, Mahmound, 3,697,857.
Canadian Patents and Development Limited: *See—*
Farley, Rene; and Rocheleau, David O., 3,697,663.
Richards, Harold R., 3,697,219.
Cancer, Ralph A.: *See—*
Taylor, Larry H.; Porter, William D.; Anderson, William J.; and Cancer, Ralph A., 3,697,007.
Canfield, Alan R.: *See—*
Desjardins, Stanley P.; Canfield, Alan R.; and Wilson, Jonathan W., 3,696,999.
Canon Kabushiki Kaisha: *See—*
Ihara, Takashi; Matsuo, Takehiko; and Ohhara, Katsunobu, 3,697,302.
Canon Kabushik Kaisha: *See—*
Tanikoshi, Kinji, 3,696,719.
Captocap Limited: *See—*
Van Baarn, Paul S., 3,696,957.
Cardenas, Carlos G.; and Brady, Donnie G., to Phillips Petroleum Company. Brominated adducts of acyclic trienes. 3,697,607, Cl. 260-648.00c.
Cardwell Machine Company, The: *See—*
Bonner, Charles W., Jr.; and Houck, Curtis T., 3,696,817.
Carfora, Joseph. Lavatory-water closet combination. 3,696,448, Cl. 4-3.000.
Carini, Eugene P. Fluid driven electrical power apparatus. 3,697,765, Cl. 290-54.000.
Carlile, Alfred E.: *See—*
Reynolds, Rolfe E.; and Carlile, Alfred E., 3,696,470.
Carlin, Ralph E.; and Rigg, Ralph R., to General Motors Corporation. Defrost water drain trap. 3,696,632, Cl. 62-285.000.
Carmet Company: *See—*
Schnellamn, Oscar; and Stier, Henry Willy, 3,696,561.
Carnisio, Giuseppe: *See—*
Pasquino, Pietro; Benzoni, Luigi; Carnisio, Giuseppe; and Colombo, Luigi, 3,697,578.
Carossi, Jean-Claude; Dufayet, Jean-Pierre; and Dujardin, Roger. Frequency controlled Hartley oscillator circuit for non-destructive eddy current testing of an electrically conductive material. 3,697,868, Cl. 324-40.000.
Carpenter, David B.; and Thompson, Edward A., to Ashland Oil, Inc. Method for producing naphthalene. 3,697,414, Cl. 208-85.000.
Carpetech Corporation: *See—*
Colt, James G., 3,697,771.
Carroll, Ronald Frank, to National Research Development Corporation. Lifting device. 3,697,116, Cl. 294-103.000.
Carrozzeria Pininfarina Societa per Azioni: *See—*
Fioravanti, Leonardo, 3,697,767.
Carson, Don B.; and Hennemuth, William R., to Universal Oil Products Company. Fluid contacting method for fluid-solid contacting chambers. 3,697,416, Cl. 208-146.000.
Carter, James L., to Esso Research and Engineering Company. High surface area nickel catalyst. 3,697,445, Cl. 252-452.000.
Carter, William C.; Duke, Keith A.; and Jessep, Donald C., Jr., to International Business Machines Corporation. Error correction system for use with a rotational single-error correction, double-error detection hamming code. 3,697,949, Cl. 340-146.1al.
Cartmell, James V.: *See—*
Churchill, Donald; Cartmell, James V.; and Miller, Robert E., 3,697,297.
Cartridge Television, Inc.: *See—*
Protas, Arthur I., 3,697,676.
Case, Forrest N.: *See—*
Acree, Elick H.; Brashear, Hugh R., Jr.; and Case, Forrest N., 3,697,756.
Casey, Horace Craig, Jr.; and van Roosbroeck, Willy Werner, to Bell Telephone Laboratories, Incorporated. Relaxation semiconductor devices. 3,697,834, Cl. 317-237.000.
Cash, George O., Jr.: *See—*
Joyner, Frederick B.; Cash, George O., Jr.; and Meyer, Max F., Jr., 3,697,465.
Casula, Pierluigi: *See—*
Rovati, Luigi; Mascherpa, Sergio; and Casula, Pierluigi, 3,697,652.
Caudle, James William: *See—*
Loos, Edwin; and Caudle, James William, 3,697,101.
Cauquis, Roger Daniel. Fishing lure. 3,696,547, Cl. 43-42.390.
Cavanna, Cesar E.: *See—*
Eifel, Paul J.; and Cavanna, Cesar E., 3,696,959.
Cavitron Corporation: *See—*
Kleesattel, Claus, 3,697,867.
Cawood Wharton & Company Limited: *See—*
Cooper, Cyril Walker, 3,697,055.
CCI Aerospace Corporation: *See—*
Johnson, Allan M.; and Gilman, Richard F., 3,697,410.
Johnson, Allan M., 3,697,418.
Celanese Corporation: *See—*
Champ, Antony E.; and Hendry, Charles Malcolm, 3,697,492.
Celase Corporation: *See—*
Braunstein, David M., 3,697,624.
Centenary Central, Inc.: *See—*
Sauer, Louis E.; and Miller, Orville C., 3,696,480.
Ceyzeriat, Louis: *See—*
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,697,568.
CF & I Engineers, Inc.: *See—*
Steele, Clarence R.; Price, Frank B.; and Marshall, John M., 3,697,324.
Chabala, Leonard V.; and Evans, David M., to S&C Electric Company. Breather for operating mechanism housing for high voltage switches and the like. 3,696,729, Cl. 98-1.000.
Chabala, Leonard V., to S & C Electric Company. High voltage switch with preinsertion resistor connected in the circuit through graphite corona balls. 3,697,712, Cl. 200-146.00r.
Chadha, Rajendra N.; Arthur, Ralph P.; and Schweiker, George C., to Shingleton, Carroll R. and Borg-Warner Corporation. High temperature nitrile elastomer. 3,697,489, Cl. 260-80.700.
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, to Gosudarstvenny Sojuzny Institut Po Proektirovanijuagresgatov Staleliieinogo i Prokatnogo Proizvodstva Dlya Chernou Metallurgii. Oxygen toyere of a stee-melting mill. 3,697,058, Cl. 266-34.001.
Chamberlain, Terrance L.; Sears, Richard P.; and Fletcher, Ivan H., Jr., to Coin Sales Corporation. Method for making sandwich laminations in one pass. 3,697,360, Cl. 156-551.000.
Chambers, Derek: *See—*
Bryden, Joseph E.; and Chambers, Derek, 3,697,955.
Chambers, Earl L.: *See—*
Plasket, Chesteen S., 3,696,556.
Champ, Antony E.; and Hendry, Charles Malcolm, to Celanese Corporation. Acrylonitrile polymerization. 3,697,492, Cl. 260-85.5es.
Champeau, Andre R.: *See—*
Blachier, Bruno L.; and Champeau, Andre R., 3,697,898.
Chandler Evans Inc.: *See—*
Thompson, Raymond V., 3,697,020.
Chang, Robert Wu-Lin, to Bell Telephone Laboratories, Incorporated. Fast start-up system for automatic transversal equalizers. 3,697,897, Cl. 333-18.000.
Chapman, Ronald W., to Shell Oil Company. End-of-tubing locator. 3,696,865, Cl. 166-64.
Chappell, Peter Lee: *See—*
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, 3,697,729.

Charbonnier, Georges R. Control and measure instrument for underwater diving. 3,696,610, Cl. 58-145.00r.

Charman, Walter M., Jr.; Hayes, Robert R.; Middaugh, George J., Jr.; and Wetzig, John M., III, to Oglebay Norton Company. Method and apparatus for forming a member from an excess slurry of refractory material. 3,697,631, Cl. 264-37.000.

Chase-Shawmut Company, The: *See—*
Belcher, Richard A.; and Kozacka, Frederick J., 3,697,916.

Chatard, Michel; Grolet, Pierre; and Reynard, Remi, to Institut Francais Du Petrole des Carburants et Lubrifiants Rueil Malmaison. Device for gripping elongated members. 3,697,114, Cl. 294-86.260.

Chaumeau, Andree: *See—*
Croissant, Pierre Michel Rene; Armbruster, Jean-Claude; and Chaumeau, Andree, 3,697,327.

Chemical Construction Corporation: *See—*
Shah, Indravadan S., 3,696,929.

Chen, James Ling, to Squibb, E. R., & Sons, Inc. Periodontal bandage and backing therefor. 3,696,811, Cl. 128-156.000.

Chermensky, Dmitry Pavlovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Chesser, Billy G.: *See—*
Browning, William C.; and Chesser, Billy G., 3,697,498.

Chevron Research Company: *See—*
Brown, Melancthon S., 3,697,571.
Brown, Melancthon S., 3,697,572.
Danzik, Mitchell; and House, Ralph, 3,697,573.
Lowe, Warren, 3,697,426.
Runge, Richard J., 3,697,864.

Chiron, Bernard; Deschamps, Andre; and Duffau, Louis, to Societe Lignes Telegraphiques et Telephoniques. Microstrip circuits wherein non-magnetic insulating substrate and magnetic insert have same crystalline structure. 3,697,901, Cl. 333-84.00m.

Chisholm, Douglas S., to Dow Chemical Company, The. Extrusion die. 3,697,211, Cl. 18-12.0dm.

Chow, Ho; and Chow, Junlin Wong. Key case. 3,696,649, Cl. 70-456.00r.

Chow, Junlin Wong: *See—*
Chow, Ho; and Chow, Junlin Wong, 3,696,649.

Chow, Woo F., to Sperry Rand Corporation. Associative and random access device. 3,697,964, Cl. 340-174.0pc.

Christ, David, to Devenco Incorporated. Vehicle location system and method. 3,697,941, Cl. 340-23.000.

Christ, Klaus H., to Bosch, Robert, G.m.b.H. Bipolar circuit device. 3,697,807, Cl. 317-16.

Christensen, Edward Walter, II; and Eu Daly, Ronald Dale, to RCA Corporation. Deflection yoke mount. 3,697,909, Cl. 335-210.000.

Christensen, Henry Marinus. Method of making iron dextran-preparations. 3,697,502, Cl. 260-209.00d.

Christensen Jay Arthur; and Compton, Theron Frank, said Christensen assor. to said Compton, Theron Frank. Fishing reel. 3,697,011, Cl. 242-84.100.

Christman, Willard A.; and Jones, Billy R., to General Motors Corporation. Bridge rectifier heat sink assembly. 3,697,814, Cl. 317-100.000.

Christopher, John, to Santa Fe International Corporation. Pipe welding apparatus and methods therefor. 3,697,720, Cl. 219-8.500.

Chrysler Corporation: *See—*
Pace, John G., 3,696,620.

Chudakov, Vyacheslav Andreevich: *See—*
Khrenov, Konstantin Konstantinovich; and Chudakov, Vyacheslav Andreevich, 3,697,914.

Churchill, Donald; Cartmell, James V.; and Miller, Robert E., to National Cash Register Company, The. Gelatin-gum arabic capsules containing cholesteric liquid crystal material and dispersions of the capsules. 3,697,297, Cl. 106-131.000.

Ciba Geigy Corporation: *See—*
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,585.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,592.

Ciba-Geigy AG: *See—*
Ackermann, Hans; and Beffa, Fabio, 3,697,500.
Dietzsch, Hans Joachim; and Dietzsch, Otto, 3,697,635.
Kundt, Edmund; Klaiber, Max; Leitz, Wilfried; and Vom Rath, Herbert, 3,696,955.
Porret, Daniel; and Habermeier, Juergen, 3,697,539.
Pugin, Andre, 3,697,526.
Siegrist, Adolf Emil, 3,697,513.
Winter, Roland A. E., 3,697,520.

Ciba-Geigy Corporation: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,697,460.
Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, 3,697,515.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,604.
Paltauf, Fritz; Margot, Alfred; and Brenneisen, Paul, 3,697,555.
Rousselot, Felix, 3,696,972.

Cigala & Bertinetti S.a.s.: *See—*
Lampredi, Aurelio, 3,696,685.

Cincinnati Mine Machinery Co.: *See—*
Krekeler, Claude B., 3,697,137.

Cines, Martin R., to Phillips Petroleum Company. Recovery of diluent in arylene sulfide polymer production. 3,697,487, Cl. 260-79.100.

Ciriack, Gunther: *See—*
Eckert, Georg; and Ciriack, Gunther, 3,697,321.

Cirulis, Uldis: *See—*
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,697,936.

Citizen Watch Co., Ltd.: *See—*
Kato, Yoshiaki; and Ohuye, Hideki, 3,697,789.

Clack, Peter Joseph; Wiswell, James David; and Clemens, Anton Hubert, to Miles Laboratories, Inc. Apparatus to produce data count signals. 3,697,730, Cl. 235-92.0mt.

Claeys, Ronald, to Wheelabrator-Frye Inc. Method for deflashing ceramic materials. 3,696,565, Cl. 51-320.000.

Clark, Donald B.: *See—*
Brown, George T., Jr.; and Clark, Donald B., 3,697,323.

Clark, Harold E., to Xerox Corporation. Continuous imaging apparatus. 3,697,160, Cl. 355-3.000.

Clark, Melville, Jr.; and Luce, David A., to Melville Clark Associates. Signal processing utilizing basic functions. 3,697,703, Cl. 179-1.0sa.

Clark-Reliance Corporation: *See—*
Goellner, Allan R., 3,696,829.

Clauson-Kaas, Niels: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,697,460.

Clayton Specialties, Inc.: *See—*
Jarrett, Earl K., 3,697,710.

Cleary, Alan. Touch detecting teaching machine. 3,696,525, Cl. 35-9.00b.

Clecak, Nicholas J.; and Cox, Robert J., to International Business Machines Corporation. Conjugated nitro amines. 3,697,595, Cl. 260-566.00r.

Clemens, Anton Hubert: *See—*
Clack, Peter Joseph; Wiswell, James David; and Clemens, Anton Hubert, 3,697,730.

Clement, J. W., Company: *See—*
Kisker, Laurence J.; and Mathewson, William G., 3,697,657.

Clendenin Investors Limited Partnership: *See—*
Atkinson, Roger F.; Parr, Richard H., Jr; and Weil, Edward A., 3,697,984.

Clevite Corporation: *See—*
Sauerland, Franz L., 3,697,903.

Clorox Company, The: *See—*
Maddox, Lodric L., 3,697,217.
Summerfelt, Vernon E., 3,697,431.

Close, Arthur L., Jr. Barbecue grill. 3,696,800, Cl. 126-25.00a.

Closse, Annemarie; and Harri, Eugen, to Sandoz Ltd., a/k/a Sandoz AG. Antibiotic SL3364. 3,697,650, Cl. 424-122.000.

Cluett, Peabody & Co., Inc.: *See—*
Brown, Fred A., III; and Le Mere, Roger, 3,697,354.

Coats, John H.: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Pyke, Thomas R., 3,697,380.

Cobble, James T., to B&J Machinery Co., Inc. Yarn beam rack. 3,697,013, Cl. 242-129.800.

Cohen, Martin J., to Franklin Gno Corporation. Plasma chromatograph with internally heated inlet system. 3,697,748, Cl. 250-41.9tf.

Coin Sales Corporation: *See—*
Chamberlain, Terrance L.; Sears, Richard P.; and Fletcher, Ivan H., Jr., 3,697,360.

Colby, Kenneth G., to Sperry Rand Corporation. Collision avoidance system. 3,697,986, Cl. 343-5.00r.

Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., to United States of America, Navy, mesne. Rod warhead. 3,696,750, Cl. 102-67.000.

Colgate-Palmolive Company: *See—*
Douglas, Livingston C., 3,696,915.
Maxwell, Milton, 3,697,754.
Miles, Gilbert De Wayne, 3,696,919.
Olson, Frank Wesley, Jr.; and Roberts, Karl Hutcheson, 3,697,452.
Sundby, Bjorn; and Wixon, Harold Eugene, 3,697,423.

Collins Radio Company: *See—*
Cory, Terry S.; and Markley, Roger A., 3,697,999.
Faustlin, James L.; and Saenz, Eliseo, 3,697,893.
Frazier, Melvin A., 3,697,861.

Collis, Ronald T. H., to Stanford Research Institute. Method and system for detecting clear air turbulence. 3,696,670, Cl. 73-170.00r.

Colman, Benjamin W.: *See—*
Hocking, Loren P.; and Lotti, Louis B., 3,697,942.

Colombo, Luigi: *See—*
Pasquino, Pietro; Benzoni, Luigi; Carnisio, Giuseppe; and Colombo, Luigi, 3,697,578.

Colombo, Piero. Method and apparatus for the continous casting of flat blooms or the like. 3,696,860, Cl. 164-73.000.

Colt Industries Operating Corporation, mesne: *See—*
Kennedy, Ralph C.; and Torning, Ralph R., 3,696,543.

Colt, James G., to Carpetech Corporation. Carpet cleaning apparatus with electrical power conditioning means. 3,697,771, Cl. 307-154.000.

Colton, Frank B.; Mikulec, Richard A.; and Nicholson, Robert T., to Searle, G. D., & Co. N-(3-Oxopregna-4, 17(20)-dien-21-yl) quaternary salts and 19-nor derivatives corresponding. 3,697,509, Cl. 260-239.500.

Columbia Broadcasting System, Inc.: *See—*
Zilius, Tadas, 3,696,549.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Newman, Douglas A., 3,697,677.

Colwell, Lester V., to Hammond Machinery Builders, Inc. Electrochemical grinding apparatus. 3,697,403, Cl. 204-218.000.

Comber, James D. Lock switch and security system for motor vehicle electrical circuits. 3,697,945, Cl. 340-64.000.

Combridge Thermionic Corporation: *See—*
Irons, Fred H., 3,697,900.

Combustion Engineering, Inc.: *See—*
Frey, Donald J.; and Opp, Warren P., 3,697,229.
Liebig, Preston D.; and Hurlbut, William B., Sr., 3,696,589.

Combustion Power Company, Inc.: *See—*
Smith, Richard D.; and Furlong, Dale A., 3,696,795.

Commercial Affiliates, Inc.: *See—*
Mildon, James R., 3,696,476.

Commercial Solvents Corporation: *See—*
Hodge, Edward B., 3,697,548.

Commissariat a l'Energie Atomique: *See—*
Gauthron, Maurice, 3,697,377.

Commonwealth Scientific and Industrial Research Organization: *See—*
Blackwood, James O.; and Cullis, Brian D., 3,697,610.

Communications Satellite Corporation: *See—*
Blachier, Bruno L.; and Champeau, Andre R., 3,697,898.

Compagnie Francaise des Petroles, Societe Anonyme: *See—*
Cortes, Abel C., 3,696,875.

Compagnie Generale d'Electricite: *See—*
Biet, Jean-Pierre; Nguyen, Quang Tan; Peres, Gerard; and Ripoche, Gerard, 3,697,760.
Melchior, Gerard; and Sinobad, Dusan, 3,697,880.

Compagnie Industrelle des Telecommunication: *See—*
Louvel, Guy, 3,697,902.

Compton, Theron Frank: *See—*
Christensen Jay Arthur; and Compton, Theron Frank, 3,697,011.

Compupop, Inc.: *See—*
Day, Alan M.; and Browning, Gordon D., 3,697,289.

Comstock, Lowell R.: *See—*
Smith, Percy L.; and Comstock, Lowell R., 3,697,625.

Condeco Automation, Inc.: *See—*
Whitfield, Homer G., 3,696,824.

Conn, James B.; Delbauve, J. Richard; and Lilienkamp, Hugh, to United States of America, Navy. Solid state radio frequency voltage controlled oscillator, power amplifier and direct current power supply. 3,697,886, Cl. 331-69.000.

Conover, Lloyd H.; and Woodward, Robert B., to Pfizer Inc. Anthracyclidine-acetic acid derivatives. 3,697,552, Cl. 260-351.000.

Consan Pacific Incorporated: *See—*
Saurenman, Donald G.; and Smith, Harold W., 3,696,791.

Continental Can Company, Inc.: *See—*
Holk, Albert J., Jr., 3,696,961.
Kochevar, John W., 3,696,989.

Continental Oil Company: *See—*
Folmer, Orville F., Jr., 3,697,750.
Young, Gary Clifford; and Kleinpeter, Joseph A., 3,696,587.

Cooper, Cecil D. Artificial rumen stimulator. 3,696,787, Cl. 119-1.000.

Cooper, Cyril Walker; deceased (by Knight, Edgar; executor), to Cawood Wharton & Company Limited. Heat treatment of bodies of combustible material. 3,697,055, Cl. 263-8.00r.

Cooper, Herbert W., to Westinghouse Electric Corporation. Interferometer and angle encoding navigation system. 3,697,997, Cl. 343-108.00r.

Cooper, Lloyd R., to Heppenstall Company. Production of large steel ingots with consumable vacuum arc hot tops. 3,696,859, Cl. 164-52.000.

Coors Porcelain Company: *See—*
Maytag, John Hardy, 3,696,657.

Coors Porcelin Company: *See—*
Moss, James R.; Roe, Richard R.; Coubrough, Lawrence E.; and Buck, Robert W., 3,697,836.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Automatic coupling system for freight cars. 3,696,941, Cl. 213-76.000.

Coppinger, Eugene A.; and Johnson, Benjamin M., to United States of America, Atomic Energy Commission. Production of uranium and plutonium carbides and nitrides. 3,697,436, Cl. 252-301.10r.

Coran, Aubert Yaucher: *See—*
Boustany, Kamel; and Coran, Aubert Yaucher, 3,697,364.

Corbell, Paul I.: *See—*
Bailey, James R.; Corbell, Paul I.; and Korta, Lawrence B., 3,697,989.

Corbett, William H.: *See—*
Brejcha, Robert J.; and Corbett, William H., 3,696,669.

Corder, Joe B. Extractor and pusher. 3,696,496, Cl. 29-260.000.

Corning Glass Works: *See—*
Banks, Howard F., 3,697,961.

Coronelli, Carolina; and Craveri, Renato. Antibiotic substance from a thermophilic actinomycetes. 3,697,646, Cl. 424-117.000.

Correll, Edward Max, to General Electric Company. Metal-to-glass-to-metal hermetic seal. 3,697,823, Cl. 317-230.000.

Cortes, Abel C., to Compagnie Francaise des Petroles, Societe Anonyme. Diamond-studded drilling tool. 3,696,875, Cl. 175-329.000.

Cory, Terry S.; and Markley, Roger A., to Collins Radio Company. Rotatable bi-planar series-fed log-periodic HF antenna. 3,697,999, Cl. 343-763.000.

Cosmetics & Pharmaceuticals, Inc.: *See—*
Madigan, Edward J., 3,697,642.

Cottell, Eric C. Hand-held air compressor and liquid spray device. 3,696,973, Cl. 222-193.000.

Cotton, Charles C.: *See—*
Palmer, Donald M.; Cotton, Charles C.; and Hodges, Willmer F., 3,696,599.

Coubrough, Lawrence E.: *See—*
Moss, James R.; Roe, Richard R.; Coubrough, Lawrence E.; and Buck, Robert W., 3,697,836.

Cox, Robert J.: *See—*
Clecak, Nicholas J.; and Cox, Robert J., 3,697,595.

Coyle, Roy M., Sr., 1/2 to Wrau, Norman J. Thermostatic expansion valve for refrigeration system. 3,696,628, Cl. 62-115.000.

Craft, Jack: *See—*
Avins, Jack; and Craft, Jack, 3,697,885.

Craig, Colin: *See—*
Ponsen, Catharinus M., 3,696,947.

Craig, Grantland A., to Paper Converting Machine Company, Inc. Garment-making method. 3,696,445, Cl. 2-243.000.

Craveri, Renato: *See—*
Coronelli, Carolina; and Craveri, Renato, 3,697,646.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., to Burroughs Wellcome Co. 5-Benzyl pyrimidines intermediates. 3,697,512, Cl. 260-240.00r.

Crippa, Eugene R.; and Lowry, Ray B., to United States of America, Navy. Magnetic tape with plural clocks. 3,697,969, Cl. 340-174.10a.

Croft Metals, Inc.: *See—*
Hallin, Peter R., 3,696,560.

Croissant, Pierre Michel Rene; Armbruster, Jean-Claude; and Chaumeau, Andree, to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme). Electrolyte for dry batteries and dry cell batteries using such electrolyte. 3,697,327, Cl. 136-157.000.

Cross, David F. W.: *See—*
Oakes, Vincent; and Cross, David F. W., 3,697,463.

Cruse, William M. Fluid actuated stage control s-stem with fluid flow leadout signal. 3,697,047, Cl. 254-141.000.

Cryomedics, Inc.: *See—*
Wallach, Ronald M., 3,696,813.

Cubic Corporation: *See—*
Adams, Lloyd M.; and Hoelscher, Robert L., 3,697,017.

Cullis, Brian D.: *See—*
Blackwood, James O.; and Cullis, Brian D., 3,697,610.

Cuomo, Jerome J., to International Business Machines Corporation. Method of selective chemical vapor deposition. 3,697,342, Cl. 156-13.000.

Cuomo, Jerome J.; and Laff, Robert A., to International Business Machines Corporation. Method of selective chemical vapor deposition. 3,697,343, Cl. 156-13.000.

Cuplip, John A., II. Method of performing sequential non-mechanical and mechanical machining operations along a common centerline and mechanical. 3,696,504, Cl. 29-558.000.

Curtiss-Wright Corporation: *See—*
Gavrun, Michael I., 3,696,796.

Cziesla, Manfred J.: *See—*
Swedenberg, Clyde J.; and Cziesla, Manfred J., 3,697,340.

Da-Lite Screen Company, Inc.: *See—*
Poiter, Fred S., 3,696,856.

Dahl, Einar S., to Outboard Marine Corporation. Low-velocity discharge means for rotary mowers. 3,696,595, Cl. 56-16.900.

Daigle, Donald J.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,697,316.

Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf, 3,697,943.
Beeskow, Bruno, 3,697,144.
Wilfert, Karl; and Barenyi, Bela, 3,697,097.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Yamabe, Shigeru; Shimizu, Masanao; and Yamamoto, Tadatsugu, 3,697,514.

Dairy Equipment Company: *See—*
Peters, Norman J., 3,696,950.

Daiwa Boseki Kabushiki Kaisha: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.

Dalbey, Theodore E., to Pennsylvania Industrial Chemical Corporation. Process for preparing 2-hydroxy-4-alkoxybenzophenone. 3,697,599, Cl. 260-591.000.

Dale, Brian, to GTE Sylvania Incorporated. Semiconductor switching device. 3,697,830, Cl. 317-235.

Damusis, Adolfas, to BASF Wyandotte Corporation. Sequential process of preparing polyurethane elastomers. 3,697,483, Cl. 260-75.0ne.

Danielmeyer, Hans Guenter, to Bell Telephone Laboratories, Incorporated. Evanescent wave coupling technique for beam shaping. 3,697,888, Cl. 331-94.500.

Daniels, Alexander, to U.S. Philips Corporation. Cryogenic refrigeration device. 3,696,626, Cl. 62-6.000.

Dann, Bert H., to Bell & Howell Company. Apparatus for correcting angular errors in color video signals. 3,697,673, Cl. 178-5.4cd.
Dannat, Heinz. Hair comb. 3,696,823, Cl. 132-122.
Dannels, Bobby F.; and Shepard, Alvin F., to Hooker Chemical Corporation. Aromatic polymers containing an element of the phosphorus family. 3,697,459, Cl. 260-17.200.
Dantele, Johann, to Fichtel & Sachs AG. Clutch disc with metallic friction facings. 3,696,902, Cl. 192-107.00c.
Danzik, Mitchell; and House, Ralph, to Chevron Research Company. Linear alkylphenol sulfate-sulfonate phosphate-free detergent actives. 3,697,573, Cl. 260-457.000.
Daproux, Jacques Roland, to Societe Industrielle Honeywell Bull. Apparatus for punching record cards or tapes. 3,696,993, Cl. 234-118.000.
Darcas, Claude: *See—*
Allirot, Rene Joseph; Darcas, Claude; and Jobert, Raymond, 3,697,576.
Darling, Alan Sydney, to Johnson, Matthey & Company Limited. Method of making a dispersion strengthened metal. 3,696,502, Cl. 29-527.700.
Dart Industries, Inc.: *See—*
Schuff, Richard William; and Harris, Edson Sheppard, Jr., 3,696,987.
Data Card Corporation, mesne: *See—*
Deschenes, Raymond J.; and MacDonald, Robert N., 3,697,693.
Data Packaging Corporation: *See—*
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 3,697,014.
Davenport, Richard L.; and Niemiec, Gerald M., to Johnson, S. C., & Son, Inc. Stretch elastomer valve. 3,696,977, Cl. 222-561.000.
Davies, Robert G.: *See—*
La Cagnina, John M.; and Davies, Robert G., 3,697,407.
Davies, Robert L.: *See—*
Huth, Gerald C.; and Davies, Robert L., 3,697,829.
Davis, William E. Food chopper. 3,696,849, Cl. 146-146.
Davy and United Engineering Company Limited: *See—*
Harrison, Robert Henry, 3,696,651.
Jump, Peter Alexander Edward; and Keegan, Barclay, 3,697,261.
Day, Alan M.; and Browning, Gordon D., to Compupop, Inc. Automatic popcorn popping method. 3,697,289, Cl. 99-81.000.
Day, John J.; and Hirschman, Paul S., to Ocean Protein Corporation. Method and apparatus for hatching crustacea. 3,696,788, Cl. 119-2.000.
Day, John W., Jr., to Sealth Aero Marine Company. Bearing retainer. 3,697,145, Cl. 308-72.000.
Day, Paul P.: *See—*
Synstad, Alvin R.; Burges, Luther M.; and Day, Paul P., 3,696,495.
Dayton Steel Foundry Company, The: *See—*
Ischabrun, Richard G.; and Afanador, Carlos P., 3,697,910.
De Barros, Manuel Joaquim Monteiro, to Eurofina-Investimentos e Estudos Techicos e Financeiros, S.A.R.L. Method for the construction of brick walls. 3,696,576, Cl. 52-747.000.
De Cock, Etienne Marie, to Agfa-Gevaert N.V. Method of testing a strip material and apparatus therefor utilizing autocorrelation. 3,697,759, Cl. 250-209.000.
De Luca, Hector F.; Schnoes, Heinrich K.; and Holick, Michael F., to Wisconsin Alumni Research Foundation. 1,25-Dihydroxy cholecalciferol. 3,697,559, Cl. 260-397.200.
De Lucia, Victor E., to Torr Laboratories, Inc. Vacuum relay. 3,697,907, Cl. 335-201.
De Simone, Frank C.: *See—*
Tojza, Roman A.; and De Simone, Frank C., 3,696,905.
De Van, William T.; and Van Dyck, Ken, to Auberge Corporation. Beverage dispensing system. 3,696,969, Cl. 222-105.000.
Deakin, Alfred; deceased (by Deakin, Ida Mae; administratrix). Cap for oxygen and similar containers. 3,696,964, Cl. 220-85.
Deakin, Ida Mae: *See—*
Deakin, Alfred, 3,696,964.
Dean, Carl J., to Wright, Barry, Corporation. Reel sealing and storage apparatus. 3,696,935, Cl. 211-13.000.
Decker, Wilton K.; and Van De Velde, Valere F., said Decker assor. to said Van De Velde, Valere. Warning light housing. 3,697,738, Cl. 240-10.600.
Dega, Robert L.: *See—*
Reinhart, Henry F.; and Dega, Robert L., 3,697,202.
Dehnert, Johannes, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Basic indazole azo dye substituted by a sulfonamide. 3,697,501, Cl. 260-163.000.
DeHoff, Ronald Lee, to Vanderbilt, R. T., Company, Inc. Liquid curing agent for epoxy resins comprising a Mixture of an imidazold and an aniline-formaldehyde condensate. 3,697,462, Cl. 260-21.000.
Del Amo Enterprises, Inc.: *See—*
Harris, John L.; and Hellman, Robert W., 3,696,453.
Delbauve, J. Richard: *See—*
Conn, James B.; Delbauve, J. Richard; and Lilienkamp, Hugh, 3,697,886.
Demag Aktiengesellschaft: *See—*
Wiggershaus, Fred; and Donner, Klaus, 3,696,755.
Demas, Nickolas P., to Wagner Electric Corporation. Two-terminal, two-color indicator lamp assembly. 3,697,802, Cl. 315-65.000.
Demerdash, Nabeel A.: *See—*
Kilgore, Lee A.; and Demerdash, Nabeel A., 3,697,791.
Deming, Andrew Frank; and Lucas, Clyde M., to Alliance Manufacturing Company, Inc. Stepping motor. 3,696,680, Cl. 74-1.500.
Dempster Brothers, Inc.: *See—*
Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., 3,696,951.
Denki Kogaku Kogyo Kabushiki Kaisha: *See—*
Fukuoka, Ichiro; Kimura, Shoji; Nishimura, Takehiko; and Takahashi, Satoshi, 3,697,609.
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, to Ciba-Geigy Corporation. Substituted esters of phenyl acetic acids. 3,697,460, Cl. 260-247.20b.
Deo, Narsingh: *See—*
United States of America, National Aeronautics and Space Administration, 3,697,968.
Deschamps, Andre: *See—*
Chiron, Bernard; Deschamps, Andre; and Duffau, Louis, 3,697,901.
Deschenes, Raymond J.; and MacDonald, Robert N., to Data Card Corporation, mesne. System for maintaining the status of credit accounts. 3,697,693, Cl. 179-2.0dp.
Desjardins, Stanley P.; Canfield, Alan R.; and Wilson, Jonathan W., to Thiokol Chemical Corporation. Movable thrust nozzle for rockets. 3,696,999, Cl. 239-265.350.
Deskey, Donald, mesne: *See—*
Heston, Russell G., Jr., 3,696,629.
Desmond, Matthew J. Restraining tape for mail packaging. 3,696,921, Cl. 206-73.000.
Dessureault, Jules. Snowmobile and road wheel units therefor. 3,696,877, Cl. 180-5.00r.
Detroit Tool and Engineering Company: *See—*
Burtin, James D., 3,696,501.
Deutsch, Ralph, to North American Rockwell Corporation. Multiplexed pitch generator system for use in a keyboard musical instrument. 3,697,661, Cl. 84-1.010.
Deutsche Gold- und Silber-Scheideanstalt vormal Roessler: *See—*
Schreyer, Gerd; and Weigert, Wolfgang, 3,697,602.
Devane, Harry M. Sound muting assembly for gas flow duct systems. 3,696,883, Cl. 181-36.00b.
Devenco Incorporated: *See—*
Christ, David, 3,697,941.
Dewey, Clarence Forbes, Jr., to Xenon Corporation. Tunable laser. 3,697,889, Cl. 331-94.500.
Dewhurst, Ernest James, to Somerville Industries Limited. Paperboard container. 3,696,990, Cl. 229-37.00r.
Di Laura, Arnold E.: *See—*
Di Laura, Arnold E.; and Pratt, Donald P. (said Pratt assor. to), 3,697,082.
Di Laura, Arnold E.; and Pratt, Donald P., said Pratt assor. to Di Laura, Arnold E. Golf tee. 3,697,082, Cl. 273-205.000.
Diacon, Inc.: *See—*
Wakley, Wilbur T.; and Leeds, Michael T., 3,697,666.
Diamond Shamrock Corporation: *See—*
Lichtman, Irwin A.; and Woodward, Fred E., 3,697,440.
Dias, Fleming, to Zenith Radio Corporation. Method of making a piezoelectric transducer. 3,696,479, Cl. 29-28.350.
Dick, A. B., Company: *See—*
Podhajny, Richard M., 3,697,264.
Dickman, John J., to Missouri Research Laboratories, Inc. Card feeder for instructional devices. 3,696,527, Cl. 35-9.00r.
Didry, Yves M. Demountable partition wall. 3,696,569, Cl. 52-122.000.
Diehl: *See—*
Burkhardt, Gottfried, 3,696,994.
Diener, James H., to General Motors Corporation. Energy absorbing bumper mount. 3,697,108, Cl. 293-89.000.
Dieter, Jerry A.: *See—*
Young, David W.; and Dieter, Jerry A., 3,697,250.
Dietrich, Richard. Building having a skeleton frame. 3,696,574, Cl. 52-236.000.
Dietzsch, Hans Joachim; and Dietzsch, Otto, to Ciba-Geigy AG. Process for the manufactu of capillary exchangers. 3,697,635, Cl. 264-135.000.
Dietzsch, Otto: *See—*
Dietzsch, Hans Joachim; and Dietzsch, Otto, 3,697,635.
Diez, Gerhard H.: *See—*
Niedner, Peter Klaus; and Diez, Gerhard H., 3,696,520.
Digital Information Devices, Inc.: *See—*
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 3,697,014.
Dilday, Joseph T. Coated fertilized. 3,697,245, Cl. 71-28.000.
Dillon, Janus J.; and Snowden, Bryan T., to Food Equipment, Inc. Fowl foot remover system. 3,696,464, Cl. 17-11.000.
Dinerman, Bernard B.: *See—*
Hunter, James R.; Dinerman, Bernard B.; Mann, Abe; and Schroeder, Franklin T., 3,696,946.
Dinerstein, Samuel, to Bunker-Ramo Corporation, The. Center set for clocks. 3,696,607, Cl. 58-85.500.
Dinger, Edward H., to General Electric Company. Full wave DC motor control. 3,697,844, Cl. 318-331.000.
Dirks, Johan F.: *See—*
Uber, Jay J.; and Dirks, Johan F., 3,697,267.
Ditz-Crane: *See—*
Kough, John K.; Martin, Otis M.; and Miller, Silas N., 3,696,570.
Diversified Manufacturing and Marketing Co., Inc.: *See—*
Pope, George F., 3,697,188.
Dixon, Samuel J.: *See—*
Sollman, George H.; and Dixon, Samuel J., 3,697,977.

Dixon, T. H., & Company Limited: *See—*
Preen, Robert, 3,696,777.
Dobinson, Frank; and Saunders, James H., to Monsanto Company. High molecular weight increase of polyamides with bis(imino-oxazolidines). 3,697,486, Cl. 260-78.0sc.
Domin, Siegfried; and Nembhard, Roy. Alarm system. 3,697,971, Cl. 340-258.00c.
Donahue, John A.: *See—*
Minden, Henry T.; and Donahue, John A., 3,697,330.
Donald, John Henry: *See—*
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, 3,697,729.
Donaldson Company, Inc.: *See—*
Johnson, Lemoine L.; and Timmons, William P., 3,696,666.
Donaldson, Darrell J.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,697,316.
Donner, Klaus: *See—*
Wiggershaus, Fred; and Donner, Klaus, 3,696,755.
Donofrio, Robert L.; and Rehkopf, Charles H., to GTE Sylvania Incorporated. Process of forming cathode ray tube screens to utilize the luminous efficiency of the phosphor material. 3,697,301, Cl. 117-33.50c.
Donoghue, William James, to RCA Corporation. Signal generating circuit including a pair of cascade connected field effect transistors. 3,697,777, Cl. 307-228.000.
Dooley, John F. Golf photography dart board game including scene changing means. 3,697,073, Cl. 273-95.00r.
Doose, Conrad; and Sassin, Wolfgang, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Power line system and method for the transmission of electric energy over low temperature electric conductors. 3,697,665, Cl. 174-15.00c.
Dorlars, Alfons, to Farbenfabriken Bayer Aktiengesellschaft. Production of aryl-α-oximinoalkylketones. 3,697,596, Cl. 260-465.00e.
Dorlars, Alfons, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of α-oximinoalkyl ketones. 3,697,597, Cl. 260-566.00a.
Dorn, Jerome. Steering mechanism for toy vehicles. 3,696,554, Cl. 46-201.000.
Dornier A.G.: *See—*
Koziech, Karl-Heinz; and Teschner, Kurt, 3,697,024.
Douglas, Edward Curtis, to RCA Corporation. Method of projection printing photoresist masking layers, including elimination of spurious diffraction-associated patterns from the print. 3,697,178, Cl. 355-77.000.
Douglas, Livingston C., to Colgate-Palmolive Company. Blade dispenser. 3,696,915, Cl. 206-16.0bc.
Dourte, Rodger P.: *See—*
Stoudenheimer, Richard G.; and Dourte, Rodger P., 3,697,794.
Dow Chemical Company, The: *See—*
Anderson, Gene A., 3,696,873.
Booth, Llewellyn Delphin, 3,697,488.
Chisholm, Douglas S., 3,697,211.
Harmer, David E.; Jarema, John R.; and Leng, Douglas E., 3,697,351.
Parker, William L.; Johnson, Francis; and Martin, John, 3,697,542.
Scott, Henry H., 3,697,244.
Tomalia, Donald A.; and Ooha, Narayanlal D., 3,697,524.
Tomalia, Donald A., 3,697,537.
Wessling, Ritchie A.; and Settineri, William J., 3,697,398.
Ziegler, Earl E., 3,696,452.
Dow Corning Corporation: *See—*
Polmanteer, Keith E.; Willing, David N.; and Talcott, Thomas D., 3,697,473.
Drake, George L., Jr.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,697,316.
Drapkin, William B., to Kulka Electric Corporated. Terminal junction. 3,697,935, Cl. 339-217.
Drawert, Manfred: *See—*
Burba, Christian; Drawert, Manfred; Voigt, Hartmut; and Griebsch, Eugen, 3,697,458.
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., to Pennzoil United, Inc. Potassium phosphate manufacture. 3,697,246, Cl. 71-34.000.
Dresser Industries, Inc.: *See—*
Cope, Geoffrey Wilton, 3,696,941.
Ott, Eugene G., 3,696,876.
Sharki, Martin J.; and Mazoch, Charles J., 3,698,003.
Driscoll, Michael M.: *See—*
Healey, Daniel J., III; and Driscoll, Michael M., 3,697,890.
Dromsky, John A., to Texas Instruments, Incorporated. Method for making a composite tube. 3,696,499, Cl. 29-476.500.
Drowatzky, Karl B. Smoke tree. 3,696,939, Cl. 211-117.000.
Dryden, Julian R., to United States of America, Interior. Method for producing retorting channels in shale deposits. 3,696,866, Cl. 166-248.000.
Du Pont de Nemours, E. I., and Company: *See—*
Bellis, Harold Edward, 3,697,296.
Bellis, Harold Edward, 3,697,608.
Berezin, Gilbert H., 3,697,593.
Brake, Loren D., 3,697,449.
Bristol, John E., 3,697,495.
Knowles, Richard N., 3,697,307.
Knowles, Richard N., 3,697,594.
Nacci, George Raymond; and Toole, Richard Charles, 3,698,005.
Rushmere, John D., 3,697,586.
Strilko, Peter S., 3,697,280.
Taylor, Earl Richard, Jr., 3,697,567.
Werner, Ervin R., Jr., 3,697,309.
Du Pont de Nemours, E. I. and Company: *See—*
Ballard, Edward C., 3,697,468.
Dubois, Gerald, to Marcel Mingard. Timepiece having oscillating rotating indicator. 3,696,609, Cl. 58-125.00r.
Duchene, Joseph R., to Allied Research Products, Inc. Electrodeposition of nickel. 3,697,392, Cl. 204-49.000.
Dufayet, Jean-Pierre: *See—*
Carossi, Jean-Claude; Dufayet, Jean-Pierre; and Dujardin, Roger, 3,697,868.
Duffau, Louis: *See—*
Chiron, Bernard; Deschamps, Andre; and Duffau, Louis, 3,697,901.
Duggan, Robert B.: *See—*
Noakes, Thomas E.; Konen, Thomas P.; Kokalari, Albert; and Duggan, Robert B., 3,696,611.
Duharte-Francia, Carlos A.: *See—*
Lieberman, Hillel; Duharte-Francia, Carlos A.; and Henderson, John W., 3,697,439.
Dujardin, Roger: *See—*
Carossi, Jean-Claude; Dufayet, Jean-Pierre; and Dujardin, Roger, 3,697,868.
Duke, Keith A.: *See—*
Carter, William C.; Duke, Keith A.; and Jessep, Donald C., Jr., 3,697,949.
Dull, Helmut, to Bernhard Beyschlag Apparatebau G.m.b.H. Electric network and method of making same. 3,697,816, Cl. 317-101.0cc.
Duncan, Alfred D., to Duncanlite Laboratory, Inc. Catcher and projector employed with a substantially non-resilient ball. 3,697,074, Cl. 273-96.
Duncanlite Laboratory, Inc.: *See—*
Duncan, Alfred D., 3,697,074.
Dunham, Tom David; Yeakley, Lester Marvin; and Nagy, Andrew, to International Nominees Bahamas Limited, mesne. Custom shoe construction system. 3,696,456, Cl. 12-146.00l.
Dunne, Owen F.; Hebert, William E.; Souza, Ronald; and Wargat, Edward, to Zalking Sewing Machine & Supply Co. Thread cutting attachment for a sewing machine. 3,696,770, Cl. 112-252.000.
Dupler, Raymond R. Body and head covering. 3,696,450, Cl. 5-334.000.
Durametallic Corporation: *See—*
Hummer, Herbert B., 3,697,088.
Durcam Research and Development Company Limited: *See—*
Temple, Stephen, 3,697,344.
Durham, Roger Owen. Personal armor. 3,696,439, Cl. 2-2.500.
Duss, Walter, to Peyer, Siegfried. Multiple operating head machines, particularly multiple spindle textile spooling machines with supervisory operating time indicator. 3,697,732, Cl. 235-151.300.
Dussourd, Jules L.; and Haugen, Ronald L., to Ingersoll-Rand Company. Gas drying apparatus and method. 3,696,588, Cl. 55-163.000.
Dynaco Inc.: *See—*
Hafler, David, 3,697,692.
Dynamit Nobel Aktiengesellschaft: *See—*
Meyer, Gunther, 3,697,493.
Schade, Gerhard; and Blaschke, Franz, 3,697,480.
Eargle, William R., to Westinghouse Electric Corporation. Hinge and latch mechanism for fluorescent luminaire. 3,697,743, Cl. 240-147.000.
Eastman Kodak Company: *See—*
Ernisse, Paul J., 3,696,723.
Grant, Peter M.; Fulkerson, Brazelton; and Mench, John W., 3,697,640.
Joyner, Frederick B.; Cash, George O., Jr.; and Meyer, Max F., Jr., 3,697,465.
McCune, Ellsworth J., 3,697,174.
Milton, Kirby Mitchell, 3,697,281.
Ruben, Paul L., 3,697,155.
Eaton Yale & Towne, Inc.: *See—*
Nielson, Jay P.; and Allred, G. Allen, 3,697,112.
Eckert, Georg; and Ciriack, Gunther, to Siemens Aktiengesellschaft. Thermionic cathode and method of manufacturing the same. 3,697,321, Cl. 117-217.000.
Edeling, Curt; and Eisenmann, Joseph, to Elektro-Thermit GmbH. Frog. 3,697,747, Cl. 246-468.000.
Edgar, Howard M. Structural core. 3,697,633, Cl. 264-45.000.
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David. Dispensing system and security card for use therewith. 3,697,729, Cl. 235-61.70b.
Edwards, Jones B. Neck-mounted lighter socket. 3,697,025, Cl. 248-27.000.
EG&G, Inc.: *See—*
Gates, Percival T., Jr.; and Libbey, Albert H., 3,697,683.
Egami, Harutoshi: *See—*
Ichinose, Noboru; Egami, Harutoshi; Yokoyama, Katsunori; and Yamashita, Yohachi, 3,697,430.
Egan, Richard Stephan: *See—*
Kurath, Paul; and Egan, Richard Stephan, 3,697,547.

Ehgartner, Gabriele; and Wilsch, Herbert, to Agfa-Gevaert Aktiengesellschaft. Reel and retaining means for motion picture film or the like. 3,697,018, Cl. 242-197.000.

Eholzer, Ulrich: *See—*
Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,697,433.

Ehrenberg, Hans Joachim, to Volkswagenwerk AG. Combustion system for a heater or the like. 3,697,213, Cl. 431-79.000.

Ehret, Robert J., to Beckman Instruments, Inc. Transient suppression circuit for D.C. motor drive system. 3,697,820, Cl. 317-148.50b.

Eichelberger, Charles D.; and Musselman, Frank L., to General Electric Company. Electric power distribution substation. 3,697,819, Cl. 317-103.000.

Eickmann, Karl. Multiple rotors and control means thereto in fluid handling devices with working chambers of radially variable volume. 3,697,201, Cl. 418-132.000.

Eifel, Paul J.; and Cavanna, Cesar E., to Lox Equipment Company. Cryogenic storage vessel constructed of dissimilar materials. 3,696,959, Cl. 220-15.000.

Eigenbrode, Edwin M.: *See—*
Youtz, Donald E.; and Eigenbrode, Edwin M., 3,696,454.

Eimers, Erich, to Farbenfabriken Bayer Aktiengesellschaft. N-aryl-substituted dialkanolamino polyrethanes. 3,697,623, Cl. 260-859.00r.

Eisenberg, Bernard C., to Solbern Corporation. Machine and method for transferring predetermined amounts of material. 3,696,581, Cl. 53-35.000.

Eisenmann, Joseph: *See—*
Edeling, Curt; and Eisenmann, Joseph, 3,697,747.

Ekfeldt, Axel E.; and Wallberg, Eric W. Breech block with rim fire striker. 3,696,542, Cl. 42-16.000.

El-Banna, Mahmound, to Canadian Marcons Company. Power supply and control circuit. 3,697,857, Cl. 321-20.000.

Elco Corporation, mesne: *See—*
Zahradnik, George J., 3,697,009.

Elder, James T.; and Wright, Donald A., to Minnesota Mining and Manufacturing Company. Electromagnetic field producing apparatus and method for sequentially producing a plurality of fields. 3,697,996, Cl. 343-101.000.

Electro Corporation: *See—*
Gee, Gordon E., 3,697,779.

Electro-Nucleonics: *See—*
Maclin, Ernest, 3,696,971.

Electro-Space Fabricators, Inc.: *See—*
Straccia, William J.; Gernert, Brooke E.; and Sherer, Ronald B., 3,696,936.

Electrohome Limited: *See—*
Urwin, Peter T., 3,697,921.

Electronic Research Associates, Inc.: *See—*
Grieg, Donald D.; and Schoengold, Herbert, 3,696,885.

Electroprint, Inc., mesne: *See—*
Pressman, Gerald L.; and Kittredge, Thomas D., 3,697,164.

Elektro-Thermit GmbH: *See—*
Edeling, Curt; and Eisenmann, Joseph, 3,697,747.

Elkhart Welding and Boiler Works, Inc.: *See—*
Fisher, Robert L., 3,697,098.

Elliott Brothers (London) Limited: *See—*
Leat, Andrew Francis Vincent, 3,696,518.

Elliott, David Robert; and Greenway, John Michael, to Imperial Chemical Industries Limited. Treatment of yarns. 3,696,478, Cl. 28-12.100.

Elliott, Delbert R.; and Lewis, William T., to Bendix Corporation, The. Skid control system maximum cyclic limiter. 3,697,139, Cl. 303-21.00p.

Ellis, Peter H., to Rohr Corporation. Turbo-fan propulsion apparatus and operating method. 3,696,617, Cl. 60-229.000.

Elmore, Clifford L.; and Young, Richard C., to Teledyne Mid-American Corporation. Car retaining cushioned latch mechanism. 3,696,756, Cl. 104-251.000.

Elox Inc.: *See—*
Verner, Dalton R.; and Syria, Ronald L., 3,697,719.

Elsner, Matthew: *See—*
Audretsch, Leo M., Jr.; and Elsner, Matthew, 3,697,697.

Eltee Pulsitron: *See—*
Holliday, Jack D., 3,697,879.

Emch, George F., to United States of America, Navy, mesne. Method and apparatus for producing target range height, and elevation voltages from a PPI display. 3,697,990, Cl. 343-6.00r.

Emerson Electric Co.: *See—*
Unger, Robert W.; and Sunderman, Wallace H., 3,696,507.

Emon, Donald E.; and Riley, Donald R., to United States of America, Atomic Energy Commission. Nuclear fuel element. 3,697,373, Cl. 176-68.000.

Endura Board International, Inc.: *See—*
Pittman, Phillip D.; and Peters, Michael L., 3,696,541.

Energy Conversion Devices, Inc.: *See—*
Ovshinsky, Stanford R., 3,698,006.

Engel, Lawrence J.; and Smith, Marvin F., Jr., to Esso Research and Engineering Company. Lubricant containing low ethylene content and high ethylene content ethylene-alpha-olefin copolymers. 3,697,429, Cl. 252-59.000.

Engelhardt, Edward L.; and Remy, David C., to Merck & Co., Inc. Thioxanthone-10,10-dioxides. 3,697,544, Cl. 260-328.000.

Engle, Isaiah B. Method of incinerating refuse. 3,697,256, Cl. 75-40.000.

Engle, Thomas H., to General Signal Corporation. Brake head-centering device for railway brake apparatus. 3,696,892, Cl. 188-212.000.

Engleman, Donald E., to American Air Filter Company, Inc. Tapered separator for pleated filter. 3,696,592, Cl. 55-500.000.

Ensminger, Clifford H.; and Ruggiero, Edward M., to Texas Instruments, Incorporated. Multi-character electronic display. 3,698,012, Cl. .

Entreprise de Recherches et D'Activities Petrolieres (ELF): *See—*
Soulie, Guy; and Lozach, Gerard, 3,697,104.

Erekson, Arthur B.; and Lane, Lamcolm S., to Borden Inc. Apple slicer and celler. 3,696,847, Cl. 146-42.000.

Erickson, Allen H.: *See—*
Teletzke, Gerald H.; Knopp, Paul V.; and Erickson, Allen H., 3,697,417.

Erickson, Allen M.; and Kessler, Bernard V., to United States of America, Navy. Fabry-perot interference mirror separation system and method therefor. 3,697,182, Cl. 356-112.000.

Erickson, Keith Duane. Car top carrier. 3,696,979, Cl. 244-42.10e.

Ermanco Incorporated: *See—*
Fleischauer, Fred J.; and Hammond, Theodore (said Hammond assor. to), 3,696,912.

Ermidis, Nicholas Peter, to American Cyanamid Company. Vulcanizable elastomer composition containing triarylphosphine and triallylcyanurate. 3,697,620, Cl. 260-836.

Ernisse, Paul J., to Eastman Kodak Company. Camera with metered film advance and double exposure prevention. 3,696,723, Cl. 95-31.0fm.

Ernsberger, Glenn W.: *See—*
Kernick, Andress; and Ernsberger, Glenn W., 3,697,855.

ESB Incorporated: *See—*
Bilhorn, John M., 3,697,328.

Esco Corporation: *See—*
La Beck, Keith E., 3,697,115.

Esso Research and Engineering Company: *See—*
Carter, James L., 3,697,445.
Engel, Lawrence J.; and Smith, Marvin F., Jr., 3,697,429.
Garabrant, Arthur R.; Beerbower, Alan; and Wilson, James A., 3,696,661.
Spenadel, Lawrence; Hall, Homer J.; and Kirshenbaum, Isidor, 3,697,455.

Estlick, Raymond J., to Raytheon Company. Motion converter assembly. 3,696,684, Cl. 74-104.000.

Etablissements Pain-Bourgeas: *See—*
Matas, Carlos, 3,696,682.

Etchell, Gordon, to North American Rockwell Corporation. Saddle lockup for flexible printing plate. 3,696,744, Cl. 101-415.100.

Eu Daly, Ronald Dale: *See—*
Christensen, Edward Walter, II; and Eu Daly, Ronald Dale, 3,697,909.

Eulenberg, Hannspeter, to U.S. Philips Corporation. Circuit arrangement for producing a line-frequency sawtooth-current having a field-frequency-varying amplitude in a television display device. 3,697,801, Cl. 315-27.05d.

Eurofina-Investimentos e Estudos Techicos e Financeiros, S.A.R.L.: *See—*
De Barros, Manuel Joaquim Monteiro, 3,696,576.

Evans, David M.: *See—*
Chabala, Leonard V.; and Evans, David M., 3,696,729.

Evans, John D., to Metals, Inc. Stock rack. 3,696,763, Cl. 108-157.000.

Evans, Robert F.: *See—*
Black, Richard W.; and Evans, Robert F., 3,697,933.

Evans, Wallace D., Jr., to Rolatape Corporation. Measuring wheel construction. 3,696,510, Cl. 33-141.00r.

Everpure, Inc.: *See—*
Brejcha, Robert J.; and Corbett, William H., 3,696,669.

Ezaki, Norio: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.

Faber, Kurt H. A. E.; and Norgen, Lars E., to Sandvikens Jernverks AB. Boring bar insert. 3,697,187, Cl. 408-154.000.

Fairchild Hiller Corporation: *See—*
Berry, Thomas G., 3,696,568.

Fairchild Industries, Inc.: *See—*
Boro, William B., 3,696,694.

Faith, William T., Jr.; Steigerwalt, Ronald B.; and Robbins, Ernest A., to Rohm and Haas Company. Fish protein solubilization using alkaline bacterial protease. 3,697,285, Cl. 99-18.000.

Falke, Jay F. Tubing coupling. 3,697,102, Cl. 285-340.000.

Falkehag, Sten I., to Westvaco Corporation. Hexamethylene tetramine derivatives of alkalilignins. 3,697,497, Cl. 260-124.00a.

Fancher, Llewellyn W., to Stauffer Chemical Company. Cinnamyl carbamates. 3,697,582, Cl. 260-482.

Fantuzzo, Joseph, to Xerox Corporation. Automated touchdown development system. 3,696,783, Cl. 118-637.000.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Dorlars, Alfons, 3,697,596.
Dorlars, Alfons, 3,697,597.
Eimers, Erich, 3,697,623.
Kurz, Jurgen; Kolling Heinrich; and Federmann, Manfred, 3,697,517.
Leontaritis, Lambis; Schon, Nikolaus; Hoffmann, Hans; and Sayed, Aziz El, 3,696,498.
Schmidt, Karl-Julius; and Hammann, Ingeborg, 3,697,518.

Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,697,433.
Zecher, Wilfried; and Merten, Rudolf, 3,697,484.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Andraschek, Hans-Joachim; and Zentner, Erich, 3,697,349.
Heine, Olaf; and Knisse, Gerhard, 3,696,623.
Hertel, Hasso; Gehre, Kurt; Lowenfeld, Rudolf; and Kosubek, Uwe, 3,697,216.

Faris, William R.; and Harokopus, William P., to Bendix Corporation, The. Rear end warning system for automobiles. 3,697,985, Cl. 343-5.0pd.

Farkas, Eugene: *See—*
Bach, Nicholas J.; and Farkas, Eugene, 3,697,558.

Farley, Holt A., to American Aluminum Company. Adjustable winch for cargo tie-down. 3,697,045, Cl. 254-51.000.

Farley, James R.: *See—*
Keto, August I.; and Farley, James R., 3,697,932.

Farley, Rene; and Rocheleau, David O., to Canadian Patents and Development Limited. Pitch sustaining means for a key-operated monophonic instrument. 3,697,663, Cl. 84-1.130.

Farnam, F. D., Co.: *See—*
Farnam, Robert G., 3,697,348.

Farnam, Robert G., to Farnam, F. D., Co. Method of making gaskets. 3,697,348, Cl. 156-190.000.

Fats and Proteins Research Foundation, Inc., mesne: *See—*
Khan, Mahmood H.; and Katamay, Myron M., 3,697,651.

Faust, Eberhard: *See—*
Strien, Werner; and Faust, Eberhard, 3,697,128.

Faustlin, James L.; and Saenz, Eliseo, to Collins Radio Company. Microwave modulator having input modulation signal probe with adjustable electrical characteristics. 3,697,893, Cl. 332-16.00r.

Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, to Ciba-Geigy Corporation. Process for splitting the 7-N-acyl group from cephalosporin compounds. 3,697,515, Cl. 260-243.00c.

Federal-Mogul Corporation: *See—*
Secunda, Kenneth, 3,696,490.

Federmann, Manfred: *See—*
Kurz, Jurgen; Kolling Heinrich; and Federmann, Manfred, 3,697,517.

Fedotov, Nikolai Semenovich: *See—*
Mironov, Vladimir Florovich; Fedotov, Nikolai Semenovich; and Kozlikov, Vadim Lvovich, 3,697,569.

Fehres, Hans; and Boogert, Lucas W. P., to Van Leer (U.K.) Limited. Liquid sealed container. 3,696,962, Cl. 220-60.00r.

Feinberg, Irving; Langdon, Jack L.; and Sitler, Carl L., to International Business Machines Corporation. Monolithic integrated structure including fabrication thereof. 3,697,318, Cl. 117-212.000.

Feldstein, Nathan, to RCA Corporation. Method of metallizing an electrically insulating surface. 3,697,319, Cl. 117-212.000.

Fendall Company: *See—*
Amundsen, Paul D.; and Liautaud, John N., 3,696,442.

Fenner, James M., to National-Standard Company. Method of handling shrinkable material. 3,697,262, Cl. 75-214.000.

Fenton, Donald M., to Union Oil Company of California. Preparation of a ketone and an aldehyde by carbonylation of an olefin in the presence of a secondary alcohol. 3,697,600, Cl. 260-593.00r.

Fenton, Roger Wakfield, to Marconi Company Limited, The. Electronic character generating. 3,697,976, Cl. 340-324.00a.

Fernkopf, Forrest D.; and Wehmeier, Gilbert E. Film strip cartridge. 3,697,159, Cl. 352-128.000.

Fetter, John T.; and Olsson, Nils O., to International Harvester Company. Tilt wheel chain drive. 3,696,681, Cl. 74-13.000.

Fewel, Kenneth J.: *See—*
Brady, Jack C.; and Fewel, Kenneth J., 3,696,894.

Fiat Societa per Azioni: *See—*
Lampredi, Aurelio, 3,696,685.

Fiber Industries, Inc.: *See—*
Maycock, William E, 3,697,479.

Fichtel & Sachs AG: *See—*
Dantele, Johann, 3,696,902.
Schwerdhofer, Hans Joachim, 3,696,690.

Fidi, Werner, to Akustische u.Kino-Gerate Gesellschaft m.b.H. Helical spring for producing artificial reverberation. 3,697,059, Cl. 267-161.000.

Field, George Francis; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Irradiated products of 3H-1,4-benzodiazepine 4-oxides. 3,697,545, Cl. 260-333.000.

Fifth Dimension, Inc.: *See—*
Bitko, Sheldon S., 3,697,906.

Fioravanti, Leonardo, to Carrozzeria Pininfarina Societa per Azioni. Electric energy distribution systems. 3,697,767, Cl. 307-10.00r.

Fischer, Adolf: *See—*
Reicheneder, Franz; Kropp, Rudolf; and Fischer, Adolf, 3,697,522.

Fisher, Robert L., to Elkhart Welding and Boiler Works, Inc. Modular home transport vehicle. 3,697,098, Cl. 280-415.00r.

Fisons Pest Control Limited: *See—*
Saggers, David Thomas, 3,697,254.

Fitch, Frederick T.: *See—*
Smith, Jean G.; and Fitch, Frederick T., 3,697,435.

Fitchen, Peter F. Stapler adapter for installing doors. 3,696,984, Cl. 227-110.000.

Fleischauer, Fred J.; and Hammond, Theodore, said Hammond assor. to Ermanco Incorporated and said Fleischauer assor. to General Logistics Corporation. Brake for roller conveyors. 3,696,912, Cl. 197-127.

Fleissner, Heinz, to Vepa AG. Process and apparatus for tentering and heating textile materials. 3,696,475, Cl. 26-60.000.

Fleming, Dias, to Zenith Radio Corporation. Acoustic surface wave transmission device. 3,697,899, Cl. 333-30.000.

Fletcher, Ivan H., Jr.: *See—*
Chamberlain, Terrance L.; Sears, Richard P.; and Fletcher, Ivan H., Jr., 3,697,360.

Flint, William T.; and Tibbetts, George C. Transducers having piezoelectric struts. 3,697,790, Cl. 310-8.300.

Floreen, Stephen, to International Nickel Company, Inc., The. Highly corrosion resistant maraging stainless steel. 3,697,258, Cl. 75-128.00b.

FMC Corporation: *See—*
Mulford, Charles T., 3,696,943.

Foard, Ralph W.: *See—*
Kempema, James L.; and Foard, Ralph W., 3,697,731.

Fogle, Mark V.; and Horger, Georg, to National Cash Register Company, The. Encapsulation process by complex coacervation using inorganic polyphosphates and organic hydrophilic polymeric material. 3,697,437, Cl. 252-316.000.

Fogt, Thomas H., to General Motors Corporation. Ejecting receptacle for plastic ice tray. 3,696,635, Cl. 62-344.000.

Folmer, Orville F., Jr., to Continental Oil Company. Method for the detection of change in density of a carrier gas and apparatus therefor. 3,697,750, Cl. 250-43.50d.

Foltz, Thomas R.; Hegarty, Gerald R.; Hopkins, Ervin W.; and Wilcox, Joseph C., to Armour and Company. Sausage maturity measuring device. 3,696,662, Cl. 73-81.000.

Food Equipment, Inc.: *See—*
Dillon, Janus J.; and Snowden, Bryan T., 3,696,464.

Ford Motor Company: *See—*
Bishop, Irving N.; Mosher, Richard G.; and Simko, Aladar O., 3,696,798.
Goodale, William B., 3,696,613.
Johnson, Olin B.; and Labana, Santokh S., 3,697,312.
Koch, Wolf H., 3,697,840.
Unwenehr, Lewis E., 3,697,839.

Forney Engineering Company: *See—*
Paredes, Candelario, 3,696,804.

Forsner, Bo Ake: *See—*
Jakobsson, Karl Folke Olof; and Forsner, Bo Ake, 3,696,927.

Forsterlug, Hans: *See—*
Pfaffenberger, Erwin; and Forsterlug, Hans, 3,697,179.

Fort, Larry W.; and Marshall, Connie T., to Telex Computer Products, Inc. Synchronizing a phase-locked loop from phase encoded signals. 3,697,884, Cl. 331-1.00a.

Fortier, Andre. Fluid devices for stabilizing the position of a moving element. 3,697,142, Cl. 308-5.000.

Foster, Vincent F.; and Schreitz, Robert A., to Inductosyn Corporation. Tensioning device for position measuring transformer. 3,696,667, Cl. 73-143.000.

Foster Wheeler Corporation: *See—*
Bell, AlanEngland, 3,696,793.

Fountain City Safety Corporation: *See—*
Harris, Julian Taylor; and Turner, Thomas Adkins, 3,697,974.

Fowler, John H.; and Barnett, Robert D., to Rockwell Manufacturing Company. Valve. 3,696,831, Cl. 137-246.120.

Fox, David A., to Westinghouse Electric Corporation. Tripping circuit for static switches. 3,697,813, Cl. 317-36.0td.

Fox, Richard, to Imperial Chemical Industries of Australia and New Zealand Limited. Blasting agent package. 3,696,703, Cl. 86-20.00c.

Fozzard, George B.: *See—*
Reece, Jack E.; and Fozzard, George B., 3,697,516.

Francillon, Francis W.: *See—*
Blumenberg, Horst H.; and Francillon, Francis W., 3,696,491.

Frankel-Industries: *See—*
Bourg, Michel, 3,696,752.

Franklin Gno Corporation: *See—*
Cohen, Martin J., 3,697,748.
Wernlund, Roger F., 3,697,749.

Franks, John T., Jr.: *See—*
Apicella, Anthony M., Jr.; and Franks, John T., Jr., 3,698,011.

Frazier, Alva W.: *See—*
Jones, Thomas M.; and Frazier, Alva W., 3,697,247.

Frazier, Melvin A., to Collins Radio Company. Short circuit protected voltage regulator. 3,697,861, Cl. 323-9.000.

Frederiksen, Erik, to Laur Knudsen, Nordisk Elektricitets Selskab. Airfield inset runway light. 3,697,736, Cl. 240-1.200.

Frederiksen, Erling Knud; and Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. Esters of α-aminobenzylpenicillin. 3,697,507, Cl. 260-239.100.

Freeh, Edward J.: *See—*
Grant, Michael P.; and Freeh, Edward J., 3,697,003.

Freeport Sulphur Company: *See—*
Morris, Horton H.; Olivier, James P.; and Prescott, Paul I., 3,697,474.
Morris, Horton H.; and Prescott, Paul I., 3,697,475.

Freericks, Lambert: *See—*
Buonsante, John J.; Freericks, Lambert; Haarmann, Howard J.; and Sieglinger, John C., 3,697,702.

Freimuth, John H.; and Hurlburt, Joseph C., to Sperry Rand Corporation. Stroking jack shaft for a belt drive. 3,696,594, Cl. 56-15.200.

Freudewald, Joachim E.; and Konrad, Frederic M., to Union Carbide Corporation. Para-phenylphenol preparation. 3,697,606, Cl. 260-620.000.

Frey, Donald J.; and Opp, Warren P., to Combustion Engineering, Inc. Automatic ignition system for flaring waste combustible gases. 3,697,229, Cl. 23-277.00c.

Freyheit, Paul J.; and Lustig, Claude D., to Sperry Rand Corporation. Process for manufacturing cold cathode gas discharge devices and the product thereof. 3,697,797, Cl. 313-217.000.

Friedman and Goodman: *See—*
Posner, Seymour J., 3,697,787.

Friedrich Deckel Prazisions Mechanik und Maschinenbau: *See—*
Bschorer, Konrad, 3,697,041.

Fritz, Robert William: *See—*
Jacobs, Wayne John; Fritz, Robert William; and Peiffer, Howard Richard, 3,697,389.

Fritzsche, Harold L., to General Electric Company. Apparatus for applying powered coating material to an article. 3,696,780, Cl. 118-69.000.

Frolov, Jury Fedorovich; Nechaev, Ivan Petrovich; Basalaev, Anany Maximovich; Bedarev, Jury Dmitrievich; and Golikov, Viktor Valerjanovich. Device for sealing gap between electrode and lining of electric arc furnace. 3,697,660, Cl. 13-17.

Fruhholz, Georg: *See—*
Acker, Josef; Hofmann, Albert; and Fruhholz, Georg, 3,696,845.

Fuchs, Edward O.: *See—*
Baldwin, Wiley M.; Fuchs, Edward O.; and Sharp, Donald J., 3,697,255.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Continuous material deformation process and apparatus therefor. 3,696,652, Cl. 72-60.000.

Fuji Photo Film Co., Ltd.: *See—*
Hayakawa, Yoshihide; and Noguchi, Yasuhiro, 3,697,273.
Hayakawa, Yoshihide; and Satomura, Masato, 3,697,275.
Kimura, Shiro; Sadao, Ishige; and Kobayashi, Teruo, 3,697,540.
Ono, Hisatake; Osada, Chiakai; Watarai, Syu; and Katsuyama, Harumi, 3,697,266.
Takenaka, Haruo; Okiyama, Toshiaki; and Hiratsuka, Nobuo, 3,697,450.
Tatsuta, Sumitaka; Ueno, Wataru; Tajima, Tatsuya; and Akao, Mutsuo, 3,697,305.

Fujimuto, Yoshihisa; Kimura, Yoshio; Terasaki, Iwao; and Kitago, Takanobu, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for polymerizing liquids to polymers. 3,697,230, Cl. 23-283.000.

Fujisawa, Tamotsu; and Kojima, Takakazu, to Sagami Chemical Research Center. Proce for preparing 4-arylthio-2,6-dialkylphenols. 3,697,601, Cl. 260-609.00f.

Fukumoto, Hisashi: *See—*
Terai, Akio; Kawamura, Eiji; Fukumoto, Hisashi; and Aoki, Hidekatsu, 3,696,879.

Fukuoka, Ichiro; Kimura, Shoji; Nishimura, Takehiko; and Takahashi, Satoshi, to Denki Kogaku Kogyo Kabushiki Kaisha. Method of producing 2-chlorobutadiene-1,3. 3,697,609, Cl. 260-655.000.

Fulkerson, Brazelton: *See—*
Grant, Peter M.; Fulkerson, Brazelton; and Mench, John W., 3,697,640.

Furlong, Dale A.: *See—*
Smith, Richard D.; and Furlong, Dale A., 3,696,795.

Furnier- und Spanrholzwerk, J. F. Werz, Jr., K.G.: *See—*
Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 3,697,208.

Furuichi, Masayoshi; and Konuma, Takaaki, to Katsurogawa Denki Kabushiki Kaisha. Heating device for copying machines. 3,697,722, Cl. 219-216.000.

Gallagher, John P.; Meyers, Robert M.; Sorg, Earl H.; and Willitts, Clark M., to Thiokol Chemical Corporation. Liquid polysulfide polymeric glass-to-metal sealant composition. 3,697,472, Cl. 260-33.80r.

Gallien, Jacqueline: *See—*
Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, 3,697,215.

Ganter, Wolfgang; Assmus, Friedrich; and Sonntag, Manfred, to Gebruder Junghans Gesellschaft mit beschrankter Haftung. Piezoelectric oscillator in the form of a tuning fork. 3,697,766, Cl. 310-8.200.

Garabrant, Arthur R.; Beerbower, Alan; and Wilson, James A., to Esso Research and Engineering Company. Method and apparatus for measuring the yield stress of non-Newtonian fluids. 3,696,661, Cl. 73-54.000.

Gardner-Denver Company: *See—*
Palauro, Dieter K.; and Mayer, James R., 3,697,113.

Garen, Eric R.: *See—*
Beard, Terry D.; and Garen, Eric R., 3,697,675.

Garnet Products Limited: *See—*
Waplington, Geld A. P., 3,696,776.

Garrett Corporation, The: *See—*
Schaffer, David J.; and Sutton, Trevor G., 3,696,895.

Garrett, William R., to Smith Industries, International, Inc. Drill pipe wear sleeve. 3,697,141, Cl. 308-4.00a.

Garwood, Moody Ray. Self-cleaning bird bath. 3,696,786, Cl. 119-1.000.

Gary, Wardell: *See—*
Wilson, John I.; and Gary, Wardell, 3,697,810.

Garzia, Aldo, to Istituto Chemioterapico Italiano S.p.A. (3,4,5-Trimethoxy-benzamido)-alkanoic acids for prophylaxis and treatment of cardiac disorders. 3,697,563, Cl. 260-404.000.

Gasc, Jean-Claude: *See—*
Boucourt, Robert; Nedelec, Lucien; and Gasc, Jean-Claude, 3,697,556.
Bucourt, Robert; Nedelec, Lucien; Gasc, Jean-Claude; and Pierdet, Andre, 3,697,510.

Gascon, Jean: *See—*
Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, 3,697,215.

Gaston-Breton, Hubert: *See—*
Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, 3,697,215.

Gates, Percival T., Jr.; and Libbey, Albert H., to EG&G, Inc. Facsimile scan line response equalization system. 3,697,683, Cl. 178-7.100.

Gates Rubber Company, The: *See—*
Bixler, William L.; and Voss, Harold C., 3,696,511.

Gatzi, Karl: *See—*
Menasse, Raphael; and Gatzi, Karl, 3,697,589.

Gauck, Herbert M. Gas vapor device. 3,696,799, Cl. 123-136.000.

Gauthron, Maurice, to Commissariat a l'Energie Atomique. Vented nuclear fuel element. 3,697,377, Cl. 171-79.000.

Gavrun, Michael I., to Curtiss-Wright Corporation. Fuel combustion in a rotary piston internal combustion engine. 3,696,796, Cl. 123-8.010.

Gay Toys, Inc.: *See—*
Littleton, Arnold B., 3,696,440.
Littleton, Arnold B., 3,696,441.

Gaylord, John F., Jr., to Medical Specialties, Inc. Cervical callar having means for providing a plurality of different angular positions. 3,696,810, Cl. 128-75.000.

Gebruder Junghans Gesellschaft mit beschrankter Haftung: *See—*
Ganter, Wolfgang; Assmus, Friedrich; and Sonntag, Manfred, 3,697,766.

Gebruder Junghans G.m.b.H.: *See—*
Scholz, Gunther, 3,696,606.

Gee, Gordon E., to Electro Corporation. Function control. 3,697,779, Cl. 307-235.000.

Gehre, Kurt: *See—*
Hertel, Hasso; Gehre, Kurt; Lowenfeld, Rudolf; and Kosubek, Uwe, 3,697,216.

Geigy Chemical Corporation: *See—*
Menasse, Raphael; and Gatzi, Karl, 3,697,589.

Geigy Chemical Corporation, mesne: *See—*
Randell, Donald R., 3,696,851.

Geils, Alfred E.; Raymond, William J.; Roberts, Richard W.; and Shreck, Peter K., to Borg-Warner Corporation. Audio-visual educational apparatus. 3,697,162, Cl. 353-120.000.

General Electric Company: *See—*
Bialous, Charles A.; Campbell, Allen J.; and Liberti, Frank N., 3,697,481.
Correll, Edward Max, 3,697,823.
Dinger, Edward H., 3,697,844.
Eichelberger, Charles D.; and Musselman, Frank L., 3,697,819.
Fritzsche, Harold L., 3,696,780.
Huth, Gerald C.; and Davies, Robert L., 3,697,829.
Johnson, Frederick R.; and Palmer, David R., 3,697,195.
Kornrumpf, William P., 3,697,716.
Kornrumpf, William P.; and Harnden, John D., Jr., 3,697,717.
Larew, John J., 3,697,958.
Lester, Frank Backus; Laurent, Robert Parker; and Titemore, Robert George, 3,696,704.
Little, David W., 3,697,811.
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, 3,697,376.
Mossey, Paul W., 3,696,678.
Orth, Edward D.; and Yerman, Alexander J., 3,697,917.
Orth, Edward D.; and Yerman, Alexander J., 3,697,918.
Orth, Edward D.; and Kessel, Alvan A., 3,697,919.
Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., 3,696,500.
Umbaugh, Charles Wayne, 3,697,837.
Weaver, Earle R., 3,697,383.

General Electric Company Limited, The: *See—*
Jacobs, Michael Lawrence, 3,697,704.

General Logistics Corporation: *See—*
Fleischauer, Fred J.; and Hammond, Theodore (said Fleischauer assor. to), 3,696,912.

General Motors Corporation: *See—*
Carlin, Ralph E.; and Rigg, Ralph R., 3,696,632.
Christman, Willard A.; and Jones, Billy R., 3,697,814.
Diener, James H., 3,697,108.
Fogt, Thomas H., 3,696,635.
Koivunen, Erkki A., 3,696,893.
Matouka, Michael F., 3,697,782.
Oakes, James A., 3,697,828.
Reinhart, Henry F.; and Dega, Robert L., 3,697,202.
Riess, Joseph A., 3,697,843.

General Signal Corporation: *See—*
Bolton, Norman A., 3,697,745.
Engle, Thomas H., 3,696,892.

General Telephone Company of California: *See—*
Kira, Hiroshi, 3,696,855.

Genisco Technology Corporation: *See—*

Godinez, Peter A., Jr., 3,696,758.
Genta, Guido R., to American Aniline Products, Inc. Formylaminothioaryloxyanthraquinones. 3,697,554, Cl. 260-377.000.
Gentellalli, Gerald F. Adjustable quiver. 3,696,978, Cl. 224-1.00b.
Genuit, Luther L.: *See—*
Nowell, John R.; and Genuit, Luther L., 3,697,853.
Georgescu, Gheorghe, to Uzinele Electronica Bucharest. Method and apparatus for obtaining frequency marker pips on the wobbulated generators. 3,697,878, Cl. 328-17.000.
Gerbitz, Clarence G., to International Business Machines Corporation. Transistor switching regulator. 3,697,852, Cl. 321-2.000.
Gerhold, Clarence G.: *See—*
Boyd, David M.; and Gerhold, Clarence G., 3,696,618.
Gernert, Brooke E.: *See—*
Straccia, William J.; Gernert, Brooke E.; and Sherer, Ronald B., 3,696,936.
Geronime, Robert L., to Rosemount Inc. Heated roll temperature measurement compensator assembly. 3,697,726, Cl. 219-469.000.
Giambalvo, Vito Albert; and Ruby, Philip Randolph, to American Cyanamid Company. Preparation of pigmentary beta-quinacridone. 3,697,464, Cl. 260-279.00r.
Gibbs, Ralph Stuart. Solid state relay. 3,697,772, Cl. 307-244.000.
Giberson, Dudley F., Jr. Gas burner for furnaces, kilns, and the like. 3,697,000, Cl. 239-407.
Gibson, Earl D., to North American Rockwell Corporation. Fine timing recovery system. 3,697,689, Cl. 178-69.50r.
Gibson, Franklin E.: *See—*
Swensen, Eugene L.; and Gibson, Franklin E., 3,696,578.
Gifford, Robert T., to Vernay Laboratories, Inc. Valve responsive to temperature changes over a limited range. 3,696,997, Cl. 236-102.000.
Gilbert, Barrie, to Tektronix, Inc. Solid state scanning device. 3,697,785, Cl. 307-303.000.
Gillette Company, The: *See—*
Laiderman, Donald David, 3,697,644.
Gilman, Richard F.: *See—*
Johnson, Allan M.; and Gilman, Richard F., 3,697,410.
Gilmour, A. Scott, to Technomedic Corporation. Methods and means for determining liquid level in a container. 3,696,675, Cl. 73-295.00.
Girard, Donald A. Tube clamp. 3,697,027, Cl. 248-68.0cb.
G.K.N. Birfield Transmissions Limited: *See—*
Smith, Henry Thomas; and Millward, Thomas Hughes, 3,696,638.
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, to Veb Wtz fur Bekleidungstechnik. Method of and apparatus for folding, sewing and conveying sheet materials. 3,696,766, Cl. 112-121.110.
Glass, Marvin, & Associates: *See—*
Licitis, Gunars, 3,697,086.
Glassburner, Thomas M., Jr. Training aid for sprinters. 3,697,065, Cl. 272-59.00r.
Glatt, Otto G. Traveling cylinder printer with selective indicia on endless bonds. 3,696,740, Cl. 101-111.000.
Glazo Laboratories Limited: *See—*
Shalley, Henry M., 3,697,378.
Glickman, Richard B.; and Hartz, George R., to Berkey/Colortran, Inc. Extensible leg structure for tripod or the like. 3,697,031, Cl. 248-171.000.
Glotov, Evgeny Borisovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.
Gluck, Julius; and Lara, Raul, to Sperry Rand Corporation. Capacitive key. 3,696,908, Cl. 197-98.000.
Gluth, Norman P.; and Houghton, Richard A., to LTV Electrosystems, Inc. Digital speech signal synthesizer. 3,697,699, Cl. 179-1.0sa.
Gnecco, Arthur J.: *See—*
Peterson, Victor S.; and Gnecco, Arthur J., 3,696,679.
Godfrey, James P., to Sanders Associates, Inc. Methods and apparatus for generating electrical wave forms and guadraturephase trapezoidal and or simusoidal waveforms. 3,697,877, Cl. 328-13.000.
Godinez, Peter A., Jr., to Genisco Technology Corporation. Locomotive signaling and control system. 3,696,758, Cl. 105-61.000.
Godtfredsen, Wagn Ole: *See—*
Frederiksen, Erling Knud; and Godtfredsen, Wagn Ole, 3,697,507.
Goellner, Allan R., to Clark-Reliance Corporation. Automatic steam trap. 3,696,829, Cl. 137-183.000.
Goldman, Samuel C.; and Albrecht, Lance M., to Picker Corporation. Computer system and color adapter for imaging detectors and method of operation. 3,697,956, Cl. 340-172.500.
Goldstein, Robert P.; and Agnew, Frank R., to Westinghouse Electric Corporation. Chemical constituent sampler. 3,697,227, Cl. 23-253.0tp.
Golikov, Viktor Valerjanovich: *See—*
Frolov, Jury Fedorovich; Nechaev, Ivan Petrovich; Basalaev, Anany Maximovich; Bedarev, Jury Dmitrievich; and Golikov, Viktor Valerjanovich, 3,697,660.
Goodale, William B., to Ford Motor Company. Hydraulic steering system having auxiliary power source. 3,696,613, Cl. 60-52.00s.
Goodrich, B. F., Company, The: *See—*
Kuts, Mathew, 3,697,356.
Starmer, Philip H., 3,697,490.
Goodrich, Eugene A.; and Johnson, Robert H. Automatic balancer for rotating masses. 3,696,688, Cl. 74-573.000.
Goodrich, Lloyd D.: *See—*
Ross, Howard R.; Goodrich, Lloyd D.; and Mc Queen, Norman, 3,696,753.
Goodyear Aerospace Corporation: *See—*
Apicella, Anthony M., Jr.; and Franks, John T., Jr., 3,698,011.
Goodyear Tire & Rubber Company, The: *See—*
Hinks, William L.; and Hosterman, Harry L., 3,696,655.
Wilson, Joan L., 3,697,491.
Gordon, Gary B., to Hewlett-Packard Company. Automatic multirange display apparatus and control therefor. 3,697,960, Cl. 340-172.500.
Gordon, Richard O., to Hainischfeger Corporation. Vehicle steering system of the fluid power type and spring centered, spring modulated control cylinder therefor. 3,696,881, Cl. 180-79.20r.
Gore, William C.; and Shapiro, Eugene B., to Beatrice Foods Company. Clutch for use in the plumbing field. 3,696,639, Cl. 64-29.000.
Gossen, B., & Co. GmbH: *See—*
Pfaffenberger, Erwin; and Forsterlug, Hans, 3,697,179.
Gosudarstvenny Sojuzny Institut Po Proektirovanijuagresgatov Staleliieinogo i Prokatnogo Proizvodstva Dlya Chernou Metallurgii: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.
Goto, Minoru: *See—*
Matsuoka, Toshiro; Takeda, Keinosuke; Goto, Minoru; and Miyake, Akira, 3,697,647.
Gottschall, Gernot, to Morat, Franz, GmbH, Firma. Film-driving roller with device for stopping the drive mechanism if the film is overloaded. 3,696,982, Cl. 226-25.000.
Gould, Francis E.: *See—*
Shepherd, Thomas H.; and Gould, Francis E., 3,697,643.
GPE Controls, Inc.: *See—*
Reip, Raymond G., 3,696,837.
Grabill, Paul J., Jr.; and Suttkus, David J., to TRW Inc. Hydraulic hold-off for a mechanical feed-back system. 3,696,615, Cl. 60-54.60p.
Grace, W. R., & Co.: *See—*
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,395.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,396.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,397.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,402.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,621.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,622.
Merrill, Edward W.; and Pikarsky, Jacob M., 3,696,956.
Smith, Jean G.; and Fitch, Frederick T., 3,697,435.
Graff, David F.: *See—*
Anderson, Harold C.; and Graff, David F., 3,697,804.
Grant, John; and Longley, Miner R., to Aerotronic Associates, Inc. Cooling hood for supporting printed circuit boards during burn-in. 3,697,815, Cl. 317-100.000.
Grant, Michael P.; and Freeh, Edward J., to Industrial Nucleonics Corporation. Grinding mill method and apparatus. 3,697,003, Cl. 241-24.000.
Grant, Peter M.; Fulkerson, Brazelton; and Mench, John W., to Eastman Kodak Company. Rumen stable medicament and/or nutrient compositions. 3,697,640, Cl. 424-35.000.
Grant, Roy Arthur, to Tasman Vaccine Laboratory Limited. Processes for the purification of waste effluent. 3,697,419, Cl. 210-27.000.
Graphic Sciences, Inc.: *See—*
Von Hippel, Eric A., 3,697,691.
Gray, Linsley S., Jr.: *See—*
McDonough, John M.; and Gray, Linsley S., Jr., 3,697,616.
Greason, William Wallace, III; and Weiner, David William, to Bell Telephone Laboratories, Incorporated. Line hunting circuitry for common control communications switching system. 3,697,700, Cl. 179-18.0ab.
Greason, William Wallace, III; and Weiner, David William, to Bell Telephone Laboratories, Incorporated. Scannable line circuit for common control telephone system. 3,697,701, Cl. 179-18.0fa.
Greenberg, Myron M.; Macintyre, Steven A.; and United States of America, Navy, to System for generating compensating signals for magnetic effects of aircraft on mad system. 3,697,869, Cl. 324-43.00r.
Greenfield, Stephen J.; Howard, Anthony; and Knapp, Lowell W., to Xerox Corporation. Document handling apparatus. 3,697,063, Cl. 271-4.000.
Greenspan, George: *See—*
Buzby, George C., Jr.; Greenspan, George; and Buhle, Emmett L., 3,697,379.
Greenway, John Michael: *See—*
Elliott, David Robert; and Greenway, John Michael, 3,696,478.
Gregory, John T.: *See—*
Hobson, Willis S.; Gregory, John T.; and Klienhaus, Clarence H., 3,697,388.
Greskamp, John B., to Mallory, P. R., & Co., Inc. Capacitor having an anchoring spike. 3,697,824, Cl. 317-230.000.
Griebsch, Eugen: *See—*
Burba, Christian; Drawert, Manfred; Voigt, Hartmut; and Griebsch, Eugen, 3,697,458.

Grieg, Donald D.; and Schoengold, Herbert, to Electronic Research Associates, Inc. Decorative loudspeakers. 3,696,885, Cl. 181-31.00b.

Griffes, Milton W., to Hubbell, Harvey, Incorporated. Ribbon resistor with supporting means. 3,697,923, Cl. 338-280.000.

Grigsby-Barton, Inc.: *See—*
Pascente, Joseph E., 3,697,774.

Grisard, Jean-Claude: *See—*
Autechaud, Denis; and Grisard, Jean-Claude, 3,697,022.

Grolet, Pierre: *See—*
Chatard, Michel; Grolet, Pierre; and Reynard, Remi, 3,697,114.

Grosse, Klaus: *See—*
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.

Grossel, Stanley S.: *See—*
Braun, Martin; Grossel, Stanley S.; and Singer, Barry M., 3,697,795.

Grun, Gustav. Method of treating powder or granulate substances. 3,697,286, Cl. 99-56.000.

Grunewalder, Valentine J.; and Koeble, Earl A., to National Starch and Chemical Corporation, mesne. Pressure-sensitive adhesive. 3,697,618, Cl. 260-78.50r.

Gruzaltsski, James A. Leg supporting device. 3,696,826, Cl. 135-45.000.

Gryctko, Carl E.; Strobel, Albert; and Ball, Kenneth D., to I-T-E Imperial Corporation. Rotary handle operator with reversible cover latch. 3,697,714, Cl. 200-172.00a.

GTE Sylvania Incorporated: *See—*
Dale, Brian, 3,697,830.
Donofrio, Robert L.; and Rehkopf, Charles H., 3,697,301.

Guanella, Gustav, to Patelhold Patentverwertungs- & Elektro-Holding AG. Low frequency distartion correction in electric signaling systems. 3,697,875, Cl. 325-65.000.

Gubitz, Franklyn W., to Sterling Drug Inc. Aromatic substituted amidines. 3,697,505, Cl. 260-239.00b.

Gudjonsson, Ellidi Norddahl. Automatic fishing reel. 3,696,545, Cl. 43-15.000.

Guignon, Helen G.: *See—*
Guignon, John E.; Guignon, Helen G.; and Guignon, John E., Jr., 3,696,825.

Guignon, John E.; Guignon, Helen G.; and Guignon, John E., Jr. Tank washer. 3,696,825, Cl. 134-167.00r.

Guignon, John E., Jr.: *See—*
Guignon, John E.; Guignon, Helen G.; and Guignon, John E., Jr., 3,696,825.

Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., to Mattel, Inc. Retractable hair figure toy. 3,696,552, Cl. 46-135.000.

Gurney, John A.: *See—*
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,585.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,592.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,604.

Gygrynuk, Walter. Mobile vehicle testing apparatus. 3,697,123, Cl. 296-24.000.

Haarmann, Howard J.: *See—*
Buonsante, John J.; Freericks, Lambert; Haarmann, Howard J.; and Sieglinger, John C., 3,697,702.

Haas, Herbert: *See—*
Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 3,697,208.

Habermeier, Juergen: *See—*
Porret, Daniel; and Habermeier, Juergen, 3,697,539.

Hacker, Philip S.: *See—*
Jones, William S.; and Hacker, Philip S., 3,697,993.

Hadley, Floyd H. Boat handling apparatus. 3,697,096, Cl. 280-947.32.

Haentjens, Walter D. Truncated conical drag pump. 3,697,190, Cl. 415-73.000.

Hafler, David, to Dynaco Inc. Two-channel, four-component stereophonic system. 3,697,692, Cl. 179-1.00g.

Haines, Paul G.; and Albert, Harry Elmer; deceased (by Albert, Dorothy S.; executrix), to Pennwalt Corporation. N-Alkyl-N-arylhydroxylamines as shortstopping agents and popcorn polymer inhibitors. 3,697,470, Cl. 260-29.7.

Hainischfeger Corporation: *See—*
Gordon, Richard O., 3,696,881.

Halkey-Roberts Corporation: *See—*
Mackal, Henry H.; and Behnke, Kenneth P., 3,696,494.

Hall, Homer J.: *See—*
Spenadel, Lawrence; Hall, Homer J.; and Kirshenbaum, Isidor, 3,697,455.

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., to Ciba Geigy Corporation. Polysubstituted dihydropyrenes. 3,697,585, Cl. 260-488.00b.

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., to Ciba Geigy Corporation. Polysubstituted dihydropyrenes. 3,697,592, Cl. 260-562.00r.

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., to Ciba-Geigy Corporation. Polysubstituted dihydropyrenes. 3,697,604, Cl. 260-618.00f.

Hallin, Peter R., to Croft Metals, Inc. Adjustable aligning apparatus for movable panels. 3,696,560, Cl. 49-425.000.

Hamada, Teruma, to Amada Company Limited. Jig apparatus for a bending press. 3,696,658, Cl. 72-481.000.

Hamaker, Ralph A.; and Zucker, Edwin, to Xerox Corporation. Optical projection apparatus. 3,697,167, Cl. 355-8.000.

Hamblin, Robert J. J., to Universal Oil Products Company. Simultaneous production of gasoline and LPG. 3,697,413, Cl. 208-59.000.

Hambrick, John Earl. Stand for christmas trees. 3,697,026, Cl. 248-46.000.

Hamilton, Stoddard C., III. Lock-up device for fluid unit. 3,696,896, Cl. 192-3.280.

Hammann, Ingeborg: *See—*
Schmidt, Karl-Julius; and Hammann, Ingeborg, 3,697,518.

Hammell, Kemper Martel, to AMP Incorporated. Electrical connector. 3,697,928, Cl. 339-45.000.

Hammett, Warren Gail: *See—*
Aaron, Marvin Robert; Hammett, Warren Gail; and Oberst, James Francis, 3,697,690.

Hammond Machinery Builders, Inc.: *See—*
Colwell, Lester V., 3,697,403.

Hammond, Peter George Henry, to Bunker-Ramo Corporation. Potentiometer. 3,697,922, Cl. 338-163.000.

Hammond, Theodore: *See—*
Fleischauer, Fred J.; and Hammond, Theodore, 3,696,912.

Hanaoka, Masafumi, to Nippon Electric Co., Ltd. Plural photo-diode target array. 3,697,832, Cl. 317-235.00r.

Hand, Richard Dewey. Portable paint roller cleaning apparatus. 3,696,457, Cl. 15-4.000.

Hanewinkel, Lorenz. Visual imformation apparatus. 3,696,539, Cl. 40-125.00r.

Hansch, Ferdinand: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,697,471.

Hansen, Hans John, to Hoffmannla Roche Inc. Antigens. 3,697,638, Cl. 424-1.000.

Hanson, Lawrence G., to Burroughs Corporation. High-speed parallel binary adder. 3,697,735, Cl. 235-175.000.

Hanson, Merle E.: *See—*
Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., 3,696,750.

Hara, Nobuhiro: *See—*
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.

Hardy, Edgar E.: *See—*
Parts, Leo P.; and Hardy, Edgar E., 3,696,742.

Harefield Rubber Company Limited, The: *See—*
New, John D., 3,697,838.

Harkins, Chester M.; and Harkins, Delue M. Monitoring attachment for self-service gasoline pumps. 3,697,981, Cl. 340-359.000.

Harkins, Delue M.: *See—*
Harkins, Chester M.; and Harkins, Delue M., 3,697,981.

Harland, Philip W., to Ametek, Inc. Plastic hairspring. 3,696,687, Cl. 74-431.000.

Harlock, George H.; and Burkard, Edward A., to National Gypsum Company. Lightweight gypsum panel. 3,697,366, Cl. 161-159.000.

Harmer, David E.; Jarema, John R.; and Leng, Douglas E., to Dow Chemical Company, The. Method of bonding hollow fibers to plastic resin supports by radiation grafting. 3,697,351, Cl. 156-272.

Harnden, John D., Jr.: *See—*
Kornrumpf, William P.; and Harnden, John D., Jr., 3,697,717.

Harokopus, William P.: *See—*
Faris, William R.; and Harokopus, William P., 3,697,985.

Harp, Richard D.; and Williams, Lyle G., to United States of America, Army. Biological door seal. 3,696,561, Cl. 49-483.000.

Harper, Foye H. Seafood sorter. 3,696,925, Cl. 209-109.000.

Harper, James E. Desensitizing non-ferrous lithographic printing plates with aqueous phosphate glass compositions. 3,696,746, Cl. 101-465.000.

Harri, Eugen: *See—*
Closse, Annemarie; and Harri, Eugen, 3,697,650.

Harris, Albert Edward; and Blundell, Ian, to Ilford Limited. Photographic material comprising a silver halide element with an overlayer of gelatin hardened with mucochloric acid. 3,697,278, Cl. 96-67.000.

Harris, Edson Sheppard, Jr.: *See—*
Schuff, Richard William; and Harris, Edson Sheppard, Jr., 3,696,987.

Harris, John L.; and Hellman, Robert W., to Del Amo Enterprises, Inc. Life saving equipment. 3,696,453, Cl. 9-14.000.

Harris, Julian Taylor; and Turner, Thomas Adkins, to Fountain City Safety Corporation. Latching warning device for fifth wheel assemblies. 3,697,974, Cl. 340-275.000.

Harrison, Robert Henry, to Davy and United Engineering Company Limited. Forging manipulator. 3,696,651, Cl. 72-22.000.

Hartmann, Heinrich: *See—*
Naarmann, Herbert; and Hartmann, Heinrich, 3,697,575.

Hartmann, Rudolf; and Zimmermann, Horst. Reciprocating piston machine with a rotary hydraulic displacer between pistons and machine shaft. 3,696,614, Cl. 60-54.50r.

Hartmann, Rudolf, to Bell & Howell Company. Dual beam rangefinder. 3,696,724, Cl. 95-44.00c.

Hartwell Corporation, The: *See—*
Poe, Lloyd Richard, 3,696,891.

Hartz, George R.: *See—*
Glickman, Richard B.; and Hartz, George R., 3,697,031.

Harvey, Samuel E.: *See—*
Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., 3,696,951.
Hase, Marie: *See—*
Riester, Oskar; and Hase, Marie, 3,697,282.
Hasenbank, Kenneth N.: *See—*
Thorud, Richard A.; Snegoski, James J.; and Hasenbank, Kenneth N., 3,696,593.
Hashimoto, Takeo: *See—*
Masuda, Tetuzo; Kurosawa, Kenjiro; Hashimoto, Takeo; and Izumi, Takahisa, 3,696,730.
Haskett, Barry F.: *See—*
Bonilla, Charles F., 3,697,234.
Haskon, Inc.: *See—*
Tiffin, James R.; and Trimble, David C., 3,697,126.
Hastalis, Christopher: *See—*
Levine, Sidney V.; and Hastalis, Christopher, 3,697,061.
Hastings Manufacturing Company: *See—*
Quinlan, William J.; and Huver, Lawrence L., 3,696,497.
Hastings, Martin R.; and Luckock, Glenn W., to PPG Industries, Inc. Air drying poly(vinylidene fluoride) coatings. 3,697,298, Cl. 117-2.00r.
Hatcher, Cecil W.; and Warner, Gene. Concrete pavement cutting machine. 3,697,135, Cl. 299-39.000.
Hathaway, Richard Allen, to Ampex Corporation. Automatic threading video recorder. 3,697,679, Cl. 178-6.60a.
Hatton, John H. Agricultural product and process. 3,696,559, Cl. 47-9.000.
Haugen, Ronald L.: *See—*
Dussourd, Jules L.; and Haugen, Ronald L., 3,696,588.
Haughney, Joseph P., to Sherwin-Williams Company, The. Aqueous dispersion of polycarboxylic acid resin with silica. 3,697,467, Cl. 260-29.6ta.
Hawkins, Benjamin K. Automatic bookmark. 3,697,100, Cl. 281-42.000.
Hayakawa, Toshio: *See—*
Mohri, Etsuzo; Hayakawa, Toshio; and Nishikawa, Akira, 3,697,904.
Hayakawa, Yoshihide; and Noguchi, Yasuhiro, to Fuji Photo Film Co., Ltd. Formation of photographic images. 3,697,273, Cl. 96-35.100.
Hayakawa, Yoshihide; and Satomura, Masato, to Fuji Photo Film Co., Ltd. Process for polymerizing vinyl compounds. 3,697,275, Cl. 96-48.00r.
Hayes, Charles W., to United Aircraft Corporation. Hollow turbine blade. 3,697,192, Cl. 416-96.000.
Hayes, Robert R.: *See—*
Charman, Walter M., Jr.; Hayes, Robert R.; Middaugh, George J., Jr.; and Wetzig, John M., III, 3,697,631.
Hayre, Harbhajan Singh. Remote actuated pollution and oil flow control system. 3,697,952, Cl. 340-147.00r.
Hays, Lance G.: *See—*
United States of America, National Aeronautics and Space Administration, 3,696,833.
Healey, Daniel J., III; and Driscoll, Michael M., to United States of America, Navy, mesne. Wide deviation voltage controlled crystal oscillator with temperature compensation. 3,697,890, Cl. 331-116.000.
Hebert, William E.: *See—*
Dunne, Owen F.; Hebert, William E.; Souza, Ronald; and Wargat, Edward, 3,696,770.
Heckler & Koch GmbH, Firma: *See—*
Seidel, Alex; Moller, Tilo; and Weldle, Helmut, 3,696,706.
Hegarty, Gerald R.: *See—*
Foltz, Thomas R.; Hegarty, Gerald R.; Hopkins, Ervin W.; and Wilcox, Joseph C., 3,696,662.
Hehl, Karl. Automatic safety switch for electric current load. 3,697,812, Cl. 317-33.0sc.
Heine, Olaf; and Knisse, Gerhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Woven mat. 3,696,623, Cl. 61-38.000.
Heinrich, Theodore M.; Martin, Robert L.; and Steele, David J., to Westinghouse Electric Corporation. Battery charger connected in series with on alternating current load circuit vis a rectifers. 3,697,850, Cl. 320-39.000.
Hellman, Robert W.: *See—*
Harris, John L.; and Hellman, Robert W., 3,696,453.
Hellwarth, George A.: *See—*
Boinodiris, Stavros; and Hellwarth, George A., 3,697,980.
Henderson, John W.: *See—*
Lieberman, Hillel; Duharte-Francia, Carlos A.; and Henderson, John W., 3,697,439.
Hendry, Charles Malcolm: *See—*
Champ, Antony E.; and Hendry, Charles Malcolm, 3,697,492.
Heneghan, Leo F.: *See—*
Lee, Leonard S.; Uyeda, Yoshio; and Heneghan, Leo F., 3,697,322.
Hennemuth, William R.: *See—*
Carson, Don B.; and Hennemuth, William R., 3,697,416.
Henningsen, Erik; and Nielsen, Hans Borge, to Vald Henriksen A/S. Apparatus for liquid treatment of textile materials of string form. 3,696,645, Cl. 68-177.000.
Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Novel composition. 3,697,560, Cl. 260-399.000.
Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Novel sulfur containing di and tri unsaturated aliphatic carbonyl compounds. 3,697,561, Cl. 260-399.000.
Henry, Charles Frederick, to McCulloch Corporation. Centrifugal clutch. 3,696,901, Cl. 192-105.0ba.
Henschen, Homer Ernst, to AMP Incorporated. Termination means for flat cable. 3,697,925, Cl. 339-17.oof.
Heppenstall Company: *See—*
Cooper, Lloyd R., 3,696,859.
Heraeus, W. C., GmbH: *See—*
Seiz, Richard, 3,697,237.
Herb, Philip J.: *See—*
O'Loughlin, Francis A.; and Herb, Philip J., 3,697,669.
Herbert Products, Inc.: *See—*
Herbert, William C., Jr., 3,697,806.
Herbert, William C., Jr., to Herbert Products, Inc. Ion generator. 3,697,806, Cl. 317-2.00f.
Herbst, Richard, to Krauss-Maffei Aktiengesellschaft. Molding press. 3,697,212, Cl. 425-450.000.
Hercules Incorporated: *See—*
Lehmann, Leonard T., 3,697,347.
Rosher, Ronald; and Simmons, Ronald L., 3,697,341.
Thomson, J. Brent, 3,697,551.
Hering, Klaus: *See—*
Volker, Theodor; and Hering, Klaus, 3,697,583.
Herolzer, Ralph H., to Vanguard Industries, Inc. Device for handling baby chicks and the like. 3,696,966, Cl. 220-97.00f.
Herring, Carl R.; and Schneider, Fred J., to Western Electric Company, Incorporated. Methods of and apparatus for aligning and bonding workpieces. 3,696,985, Cl. 228-4.000.
Herrmann, Heinz, to Kalle Aktiengesellschaft. Material and process for the preparation of printing plates. 3,697,274, Cl. 96-36.300.
Hertel, Hasso; Gehre, Kurt; Lowenfeld, Rudolf; and Kosubek, Uwe, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the production of water-insoluble azo dyestuffs on textile material of cellulose or protein fibers. 3,697216, Cl. 8-46.000.
Heston, Russell G., Jr., to Deskey, Donald, mesne. Air conditioning system. 3,696,629, Cl. 62-129.000.
Hewlett-Packard Company: *See—*
Gordon, Gary B., 3,697,960.
Hiskes, Ronald, 3,697,320.
Mast, Robert E., 3,697,851.
Taylor, Robert L., 3,697,862.
Heymann, Frank J., to Westinghouse Electric Corporation. Erosion control in a steam turbine by moisture diversion. 3,697,191, Cl. 415-168.000.
Hi-Flux Corporation: *See—*
Krikorian, Garo H., 3,696,522.
Hickey, Harvey Edward: *See—*
McIntyre, Hal Byers; and Hickey, Harvey Edward, 3,696,514.
Hicks, Harris Vernon, to Lucas, Joseph, (Industries) Limited. Road vehicle lighting system having light reflection minimizing fins. 3,697,803, Cl. 315-82.000.
Higake, Sotomatsu: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.
Highsmith, Phillip E. Ferromagnetic material in a magnetic field as a propulsion system. 3,697,908, Cl. 335-209.000.
Hildebrants, Arnis, to RCA Corporation. Cathode ray tube implosion protection system and method. 3,697,686, Cl. 178-7.820.
Hill, Robert C.: *See—*
Boissevain, Mathew G.; and Hill, Robert C., 3,697,755.
Hillis, Donald A. Key holder. 3,696,650, Cl. 70-457.000.
Hinderer, Helmuth E.: *See—*
Bach, Hartwig C.; and Hinderer, Helmuth E., 3,697,478.
Hinks, William L.; and Hosterman, Harry L., to Goodyear Tire & Rubber Company, The. Apparatus for making blades. 3,696,655, Cl. 72-321.000.
Hinson, James L., to Three Way, Inc. Apparatus for separating pelletized lead or the like from granular compositions such as soil. 3,696,870, Cl. 171-17.000.
Hirako, Susumu: *See—*
Okada, Hitoshi; Imahori, Seiichi; and Hirako, Susumu, 3,697,525.
Hirao, Motohisa: *See—*
Asai, Shojiro; Hirao, Motohisa; and Maruyama, Eiichi, 3,697,338.
Hiratsuka, Nobuo: *See—*
Takenaka, Haruo; Okiyama, Toshiaki; and Hiratsuka, Nobuo, 3,697,450.
Hirohashi, Toshiyuki: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.
Hirschfeld, Tomas; and Matsu, Noboru, to Block Engineering, Inc. Hydrocarbon detector system. 3,697,226, Cl. 23-254.00r.
Hirschman, Paul S.: *See—*
Day, John J.; and Hirschman, Paul S., 3,696,788.
Hiskes, Ronald, to Hewlett-Packard Company. Method and flux for growing single crystals of garnet or orthoferrites. 3,697,320, Cl. 117-234.000.
Hitachi, Ltd.: *See—*
Asai, Shojiro; Hirao, Motohisa; and Maruyama, Eiichi, 3,697,338.
Homma, Noriyuki, 3,697,967.
Kanda, Kimio; and Ono, Kunio, 3,697,866.

Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.
Yamamoto, Masayuki; Toki, Hisashi; and Shibuya, Hideo, 3,697,334.

Hite, Perry J.: *See—*
Sarkozi, Miklos; Szabo, Andras I.; and Hite, Perry J., 3,697,896.

Hiyama, Ryu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having automatic bass tone selector. 3,697,664, Cl. 84-1.170.

Hlavaty, Albert E.: *See—*
Perina, Joseph; and Hlavaty, Albert E., 3,696,472.

Ho, Irving T.: *See—*
Beausoleil, William F.; Ho, Irving T.; Jen, Teh-Sen; and Pricer, W. David, 3,697,962.

Hobson, Willis S.; Gregory, John T.; and Klienhaus, Clarence H., to Seymour Manufacturing Co. Process of reclaiming a liquid organic solvent from a foam contaminant. 3,697,388, Cl. 203-96.000.

Hochli, Beat: *See—*
Moser, Kurt; and Hochli, Beat, 3,696,664.

Hocking, Loren P.; and Lotti, Louis B., 10% to Colman, Benjamin W. Early warning brake fault device and system. 3,697,942, Cl. 340-52.00c.

Hodge, Edward B., to Commercial Solvents Corporation. Zearalenone reduction. 3,697,548, Cl. 260-343.20f.

Hodges, Willmer F.: *See—*
Palmer, Donald M.; Cotton, Charles C.; and Hodges, Willmer F., 3,696,599.

Hoeffleur, Albert. Welding paste for resistance welding copper parts. 3,697,333, Cl. 148-24.000.

Hoehn, Hans; and Schulze, Ernst, to Squibb, E. R., & Sons, Inc. Doethyl pheny sulfonylureas. 3,697,527, Cl. 260-294.80c.

Hoehn, Hans; and Schulze, Ernst, to Squibb, E. R., & Sons, Inc. 5-Methyldipyrazolo [3,4-b;3',4'-d]pyridin-3 (2H)-ones. 3,697,532, Cl. 260-295.50t.

Hoelscher, Robert L.: *See—*
Adams, Lloyd M.; and Hoelscher, Robert L., 3,697,017.

Hoffman, John T. Dispenser for reel of filament material. 3,696,697, Cl. 83-649.000.

Hoffman, Louis S.; and Spruyt, Harry, to Beech-Nut, Inc. Support structure. 3,696,940, Cl. 211-126.000.

Hoffmann, Hans: *See—*
Leontaritis, Lambis; Schon, Nikolaus; Hoffmann, Hans; and Sayed, Aziz El, 3,696,498.

Hoffmann, Wilhelm: *See—*
Krone, Heinz; and Hoffmann, Wilhelm, 3,696,992.

Hoffmann-La Roche Inc.: *See—*
Field, George Francis; and Sternbach, Leo Henryk, 3,697,545.
Pfiffner, Albert; and Schwieter, Ulrich, 3,697,543.

Hoffmannla Roche Inc.: *See—*
Hansen, Hans John, 3,697,638.

Hofmann, Albert: *See—*
Acker, Josef; Hofmann, Albert; and Fruhholz, Georg, 3,696,845.

Hogstrom, Edwin F.: *See—*
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., 3,697,313.

Holder, David A., Jr. Attachment for charcoal burning unit. 3,697,198, Cl. 417-411.000.

Holder, Heinz: *See—*
Von Hollen, Dieter; and Holder, Heinz, 3,697,718.

Holdham, Bertram Roy, to Polydesigns Limited. Foldable platform device. 3,696,762, Cl. 108-134.000.

Holick, Michael F.: *See—*
De Luca, Hector F.; Schnoes, Heinrich K.; and Holick, Michael F., 3,697,559.

Holk, Albert J., Jr., to Continental Can Company, Inc. Protective edge for easy opening container. 3,696,961, Cl. 220-54.000.

Holliday, Jack D., to Eltee Pulsitron. On-off pulse time control. 3,697,879, Cl. 328-61.000.

Holloway, Alta, Jr. Mobile kitchen. 3,696,803, Cl. 126-276.000.

Holm, Le Roy W., to Union Oil Company of California. Soluble oil composition. 3,697,424, Cl. 252-8.55d.

Holmes, Fred S. Method and apparatus for removing sand from wells. 3,697,194, Cl. 417-54.000.

Holt, Norman I., to California Institute of Technology. Electromagnetic transducer recording head having a laminated core section and tapered gap. 3,697,705, Cl. 179-100.20c.

Holzmann, Philipp, Aktiengesellschaft: *See—*
Zerna, Wolfgang; and Muhe, Ludwig, 3,696,573.

Hombrecher, Friedrich, to Sachs, Ersa Ernst, K.G. Electric soldering iron with adjustable thermostatic temperature control. 3,697,724, Cl. 219-241.000.

Homma, Keisuke: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.

Homma, Noriyuki, to Hitachi, Ltd. Magnetic thin film memory. 3,697,967, Cl. 340-174.0ca.

Honeywell Inc.: *See—*
Blecher, Stephen, 3,697,161.
Lee, Tzuo-Chang, 3,698,010.
Lone, Peter R., 3,698,004.
Malcolm, Ronald D.; Phelan, William J.; and Sangiolo, Thomas L., 3,698,007.
McConnell, Robert G., 3,696,782.
Schoenwitz, Frank H. W., 3,697,953.
Sollman, George H.; and Dixon, Samuel J., 3,697,977.

Honeywell Information Systems, Inc.: *See—*
Nowell, John R.; and Genuit, Luther L., 3,697,853.

Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, to Tokyo Shibaura Denki Kabushiki Kaiha. Apparatus for printing railway tickets and the like. 3,696,717, Cl. 95-4.500.

Hooker Chemical Corporation: *See—*
Dannels, Bobby F.; and Shepard, Alvin F., 3,697,459.
Miller, George T., 3,697,306.
Shatz, Malcolm H.; and Leon, Edward, 3,697,331.

Hoover Ball and Bearing Company: *See—*
Wolofski, Nicholas, 3,697,133.

Hope, Stephen F. Film processor. 3,696,728, Cl. 95-89.000.

Hopkins, Ervin W.: *See—*
Foltz, Thomas R.; Hegarty, Gerald R.; Hopkins, Ervin W.; and Wilcox, Joseph C., 3,696,662.

Horgan, William J., Jr., to Blumcraft of Pittsburgh, Pa. Panic lock for a door. 3,696,648, Cl. 70-92.000.

Horger, Georg: *See—*
Fogle, Mark V.; and Horger, Georg, 3,697,437.

Hori, Shojiro; and Maruta, Hisao, to Kashiwa Asechiren Kogyo Kabushiki Kaisha. Aerosol bomb filled with starting agent for diesel engine. 3,697,240, Cl. 44-52.00.

Horizons Incorporated: *See—*
Lewis, James M.; and Shirey, John E., 3,697,276.
Ramins, Lothar, 3,697,272.

Horizons Research Incorporated: *See—*
Perry, John E., 3,697,257.

Hornung, Gerhard, to Rieker, Justus, Dr., & Co. Ski boot. 3,696,534, Cl. 36-2.5al.

Hossmann, Marcell; and Barh, Alfred, to Albiswerk Zurich AG. Circuit arrangement for an electronic distance measuring device for drawing the frequency of a measuring oscillator towards a set point frequency which is higher or lower, respectively, by a cerain predetermined value. 3,698,013, Cl. 343-7.500.

Hosterman, Harry L.: *See—*
Hinks, William L.; and Hosterman, Harry L., 3,696,655.

Houck, Curtis T.: *See—*
Bonner, Charles W., Jr.; and Houck, Curtis T., 3,696,817.

Hough, William T. Vessel having an osmotic membrane as an enclosing part thereof. 3,696,931, Cl. 210-244.000.

Houghton, Richard A.: *See—*
Gluth, Norman P.; and Houghton, Richard A., 3,697,699.

House, Ralph: *See—*
Danzik, Mitchell; and House, Ralph, 3,697,573.

Hovis, Donald B.: *See—*
Kovalcik, John N.; and Hovis, Donald B., 3,697,223.

Howard, Anthony: *See—*
Greenfield, Stephen J.; Howard, Anthony; and Knapp, Lowell W., 3,697,063.

Howard, Frank S., to United States of America, National Aeronautics and Space Administration. Geysering inhibitor for vertical cryogenic transfer pipe. 3,697,021, Cl. 244-15.00b.

Howell, Peter T. Adjustable auxiliary handle for shopping cart. 3,697,095, Cl. 280-47.260.

Howell, Roland A. Hot box detector operable with diverse type bearing assemblies. 3,697,744, Cl. 246-169.00d.

Howle, Clement Roger, to Aluminium Company of America. Anodized continuously cast decorative plate with textured surface. 3,697,393, Cl. 204-58.000.

Hrabovsky, Joseph V. Combustible strip ammunition belt. 3,696,705, Cl. 89-35.

Huang, Kwang-Ta, to United States of America, Navy. Voltage regulating circuit. 3,697,856, Cl. 321-10.000.

Hubbard, Claudia M.: *See—*
Hubbard, Glenn O., 3,696,660.

Hubbard, Glenn O.; deceased (by Hubbard, Claudia M.; executrix). Locating holes in tubing. 3,696,660, Cl. 73-40.50r.

Hubbard, James R., to Philco-Ford Corporation. Laundry dryer. 3,696,521, Cl. 34-128.000.

Hubbell, Harvey, Incorporated: *See—*
Griffes, Milton W., 3,697,923.

Huetten, Clarence, to Sperry Rand Corporation, mesne. Magnetic disc head assembly. 3,697,965, Cl. 340-174.10e.

Huggard, Leslie, to Baldwin, D. H., Company. Push type electric switch with contact post, movable coil spring contact and interposed non conductive plunger. 3,697,706, Cl. 200-5.00r.

Hughes Aircraft Company: *See—*
King, Harry J., 3,697,793.
Steigleder, Charles J.; Smithey, Linual D.; and Ydon, Lloyd E., 3,696,671.

Hughes, William B., to Phillips Petroleum Company. Hydrogenation of olefin hydrocarbons using rhodium or iridium halide complexes with metal halides. 3,697,615, Cl. 260-683.900.

Huh, William: *See—*
Richard, Norman; Jean, Robert; Huh, William; and Patton, Willard Thomas, 3,698,000.

Humber, Leslie G., to American Home Products Corporation. 5-Cycloalkylidene dibenzocycloheptene derivatives. 3,697,581, Cl. 260-479.00r.

Hummer, Herbert B., to Durametallic Corporation. Floating bushing. 3,697,088, Cl. 277-9.000.

Hunsicker, Harold Y., to Aluminum Company of America. Aluminum conductor wire. 3,697,260, Cl. 75-139.000.
Hunsucker, Jerry H. Heat curable resins prepared from phenol, formaldehyde, dimethylolpropionic acid and an alkanolamine. 3,697,482, Cl. 260-58.000.
Hunt Electronics Company: *See*—
Johnson, James C., 3,697,821.
Hunter, James R.; Dinerman, Bernard B.; Mann, Abe; and Schroeder, Franklin T., to Burroughs Corporation. Conveyor system having a plurality of carrier position sensors. 3,696,946, Cl. 214-11.00r.
Hunziker, Fritz; and Schmutz, Jean, to Sandoz Ltd.; a/k/a Sandoz AG. 2-Substituted-11-(4-methyl-1-piperizinyl)-dibenzo [b,f]-1,4-oxazapin-(4-oxide). 3,697,523, Cl. 260-268.70r.
Hurlburt, Joseph C.: *See*—
Freimuth, John H.; and Hurlburt, Joseph C., 3,696,594.
Hurlbut, William B., Sr.: *See*—
Liebig, Preston D.; and Hurlbut, William B., Sr., 3,696,589.
Huth, Gerald C.; and Davies, Robert L., to General Electric Company. Semiconductor devices with improved voltage breakdown characteristics. 3,697,829, Cl. 317-235.00r.
Huver, Lawrence L.: *See*—
Quinlan, William J.; and Huver, Lawrence L., 3,696,497.
Hykel, Knut: *See*—
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.
Hyvarinen, Kauko Juhani, to Niplex International Establishment. Cosmetic mirror. 3,697,156, Cl. 350-298.000.
I-T-E Imperial Corporation: *See*—
Gryctko, Carl E.; Strobel, Albert; and Ball, Kenneth D., 3,697,714.
Ibing, Gunther; and Neubold, Kurt, to Scholven-Chemie Aktiengesellschaft. Process for the manufacture of pyromellitic acid diimide. 3,697,541, Cl. 260-326.00c.
IBS Industrialized Building Systems, Incorporated: *See*—
Villaneu, Michel, 3,696,567.
Ichinose, Noboru; Egami, Harutoshi; Yokoyama, Katsunori; and Yamashita, Yohachi, to Tokyo Shibaura Electric Co., Ltd. Piezoelectric materials. 3,697,430, Cl. 252-62.900.
Ihara, Takashi; Matsuo, Takehiko; and Ohhara, Katsunobu, to Canon Kabushiki Kaisha. Drum-photosensitive member and method for manufacturing thereof. 3,697,302, Cl. 117-34.000.
Iizuka, Noritoshi: *See*—
Narusawa, Shozo; and Iizuka, Noritoshi, 3,696,579.
Ikoma, Masanobu, to Shinetsu Chemical Company. Method for emulsion polymerization of organosiloxanes. 3,697,469, Cl. 260-29.2.
Ilex Optical Company, Inc.: *See*—
Lewis, Donald E., 3,696,726.
Ilford Limited: *See*—
Harris, Albert Edward; and Blundell, Ian, 3,697,278.
Illinois Tool Works Inc.: *See*—
Achten, Kort Joseph, 3,697,931.
Imahori, Seiichi: *See*—
Okada, Hitoshi; Imahori, Seiichi; and Hirako, Susumu, 3,697,525.
Imai, Takeshi; Matsubara, Tamotsu; and Takenaka, Osamu, to Nippon Denso Company. Loading-and burning-proof electromagnetic coil. 3,697,913, Cl. 336-205.000.
Imai, Yoshio; Matsumura, Haruki; Yurugi, Shojiro; and Miyake, Akio, to Takeda Chemical Industries, Ltd. Oxadiazole derivatives. 3,697,530, Cl. 260-295.00r.
Imasen Electric Industrial Co., Ltd.: *See*—
Nishioka, Kenichi, 3,697,946.
Imperial Chemical Industries Limited: *See*—
Andrews, Timothy Douglas; Short, Glynn David; and Thomas, Ieuan, 3,697,528.
Elliott, David Robert; and Greenway, John Michael, 3,696,478.
Waddan, Dhafir; and Williams, Derek, 3,697,534.
Imperial Chemical Industries of Australia and New Zealand Limited: *See*—
Fox, Richard, 3,696,703.
Inaba, Shigeho: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.
Inductosyn Corporation: *See*—
Foster, Vincent F.; and Schreitz, Robert A., 3,696,667.
Industrial Nucleonics Corporation: *See*—
Grant, Michael P.; and Freeh, Edward J., 3,697,003.
Ingersoll-Rand Company: *See*—
Dussourd, Jules L.; and Haugen, Ronald L., 3,696,588.
Tibbott, David W., 3,697,189.
Ingram, John D., to Schlumberger Technology Corporation. Acoustic reflection coefficient logging. 3,697,937, Cl. 340-15.50a.
Inomata, Suekichi: *See*—
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.
Institut de Recherche et de Diffusion Industrielle P.G.E. Wood: *See*—
Moret, Michel A., 3,696,809.
Institut Elektrosvarkiimeni E. O. Patona: *See*—
Khrenov, Konstantin Konstantinovich; and Chudakov, Vyacheslav Andreevich, 3,697,914.
Institut Francais Du Petrole des Carburants et Lubrifiants Rueil Malmaison: *See*—
Chatard, Michel; Grolet, Pierre; and Reynard, Remi, 3,697,114.
Instytut Wlokien Sztucgnych i Syntetsycgnych: *See*—
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.
Integrated Controls, Inc.: *See*—
Vinson, Billy H., 3,696,720.
Inter-Probe, Inc.: *See*—
Blomgren, Oscar C., Jr., 3,697,411.
International Business Machines Corporation: *See*—
Audretsch, Leo M., Jr.; and Elsner, Matthew, 3,697,697.
Bartholomew, Gerald E.; Kostuch, Donald J.; Robinson, Thomas E.; and Rohland, William S., 3,697,951.
Beausoleil, William F.; Ho, Irving T.; Jen, Teh-Sen; and Pricer, W. David, 3,697,962.
Belleson, James Garman, 3,697,678.
Boinodiris, Stavros; and Hellwarth, George A., 3,697,980.
Bossen, Douglas C., 3,697,948.
Carter, William C.; Duke, Keith A.; and Jessep, Donald C., Jr., 3,697,949.
Clecak, Nicholas J.; and Cox, Robert J., 3,697,595.
Cuomo, Jerome J., 3,697,342.
Cuomo, Jerome J.; and Laff, Robert A., 3,697,343.
Feinberg, Irving; Langdon, Jack L.; and Sitler, Carl L., 3,697,318.
Gerbitz, Clarence G., 3,697,852.
Williams, Kenneth Barnett, 3,697,707.
International Harvester Company: *See*—
Fetter, John T.; and Olsson, Nils O., 3,696,681.
International Nickel Company, Inc., The: *See*—
Benjamin, John Stanwood, 3,696,486.
Floreen, Stephen, 3,697,258.
International Nominees Bahamas Limited, mesne: *See*—
Dunham, Tom David; Yeakley, Lester Marvin; and Nagy, Andrew, 3,696,456.
International Paper Company: *See*—
Lahay, Charles Arthur, 3,696,920.
International Products, Inc.: *See*—
Whitehead, Jack D., 3,696,801.
International Standard Electric Corporation: *See*—
Verstegen, Willi, 3,697,696.
International Telephone & Telegraph Corporation: *See*—
Kim, Sung Chul, 3,696,863.
International Telephone and Telegraph Corporation: *See*—
Lawford, Victor Nicholas, 3,696,659.
Interstab Limited, mesne: *See*—
Oakes, Vincent; and Cross, David F. W., 3,697,463.
Iowa Manufacturing Company: *See*—
Jacobson, Wayne B., 3,696,976.
Irie, Fujio: *See*—
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.
Irie, Namio, to Nissan Motor Company, Limited. Hydraulic servo valve. 3,696,839, Cl. 137-625.610.
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, to Kyorin Geiyaku Kabushiki Kaisha. Derivatives of N(N-acyl amino acyl) aminoacetonitrile. 3,697,577, Cl. 260-465.400.
Irizuki, Mamoru: *See*—
Mori, Hajime; and Irizuki, Mamoru, 3,697,180.
Irons, Fred H., to Combridge Thermionic Corporation. Admittance inversion circuits. 3,697,900, Cl. 333-80.000.
Ischabrun, Richard G.; and Afanador, Carlos P., to Dayton Steel Foundry Company, The. Magnet assembly for electric brakes. 3,697,910, Cl. 335-296.000.
Ishikawajima Harima Jukogyo Kabushiki Kaisha: *See*—
Tsuji, Shoichi, 3,697,214.
Ishizumi, Kikuo: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.
Isotopes, Inc., mesne: *See*—
Baude, John, 3,697,325.
Istituto Chemioterapico Italiano S.p.A.: *See*—
Garzia, Aldo, 3,697,563.
Itokawa, Hideo, to Taiyo Kogyo Company Limited. Bonding and assembling process by a magnetic force. 3,697,352, Cl. 156-272.000.
IWA-Rechenschieberfabrik F. Riehle KG: *See*—
Riehle, Harald, 3,697,078.
Iwai, Tadashi; Yamashina, Hisao; Takagi, Tetitsu; and Adachi, Shoichi, to Ube Industries, Ltd. Method of isolating tetraoxane by azeotropic distillation and crystallization. 3,697,386, Cl. 203-48.000.
Iwata, Mitsuo, to Victor Company of Japan, Ltd. Automatic operating control for magnetic recording and reproducing apparatus. 3,697,015, Cl. 242-186.000.
Iwata, Tetuo: *See*—
Kojima, Mikiharu; and Iwata, Tetuo, 3,696,909.
Izumi, Takahisa: *See*—
Masuda, Tetuzo; Kurosawa, Kenjiro; Hashimoto, Takeo; and Izumi, Takahisa, 3,696,730.
Jacisin, Joseph Michael; and Tropello, Sam Duane, 1/2 each to Bell Telephone Laboratories, Incorporated and Western Electric Company, Incorporated. High-pressure packing gland. 3,697,089, Cl. 277-35.000.
Jackson, Richard R. Kite. 3,697,023, Cl. 244-153.00r.
Jacobs, Donald R., to American Home Products Corporation. Merchandising fixture. 3,697,033, Cl. 248-226.00a.

Jacobs, Michael Lawrence, to General Electric Company Limited, The. Circuits for private automatic telephone exchange systems. 3,697,704, Cl. 179-86.000.

Jacobs, Wayne John; Fritz, Robert William; and Peiffer, Howard Richard, to AMP Incorporated. Method of forming electrical contact materials. 3,697,389, Cl. 204-37.00r.

Jacobson, Wayne B., to Iowa Manufacturing Company. Linearized gate control system for multiple feeder and hopper arrangements. 3,696,976, Cl. 222-504.000.

Jaech, Merrell O., to Morton-Norwich Products, Inc. Article depositing machine improvement. 3,696,968, Cl. 221-265.000.

Jahnke, Heinz K.; and Meyer, Heinz F., to Upjohn Company, The. Process for the isolation of organic hydrazo reactive ketones. 3,697,557, Cl. 260-397.450.

Jakobsson, Karl Folke Olof; and Forsner, Bo Ake, to Aktiebolaget Celleco. Hydrocyclone. 3,696,927, Cl. 209-211.000.

Jammet, Jean Firmin, to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme). Battery including pair of air-depolarized cells. 3,697,326, Cl. 136-86.00a.

Janu, George J., to Johnson Service Company. Flow control system employing a series reference resistor. 3,696,830, Cl. 137-209.000.

Japan Gas-Chemical Company, Inc.: *See—*
Asakawa, Kazuo; and Narita, Kaoru, 3,697,546.

Jarema, John R.: *See—*
Harmer, David E.; Jarema, John R.; and Leng, Douglas E., 3,697,351.

Jarrett, Earl K., to Clayton Specialties, Inc. Trigger assembly for article conveying machine. 3,697,710, Cl. 200-61.410.

Javarey, William E., Jr.; and Adams, Richard C., to Schjeldahl, G. T., Company. Method of attaching handles to film bags. 3,697,359, Cl. 156-518.000.

Jaxheimer, William W. Electrical meter reading. 3,697,970, Cl. 340-183.000.

Jaycox, Willardr., to Tampax Incorporated. Tampon applicator. 3,696,812, Cl. 128-263.000.

Jean, Robert: *See—*
Richard, Norman; Jean, Robert; Huh, William; and Patton, Willard Thomas, 3,698,000.

Jedlicka, Philip A., to Minnesota Mining and Manufacturing Company. Beam defining apparatus. 3,696,715, Cl. 95-1.00r.

Jen, Teh-Sen: *See—*
Beausoleil, William F.; Ho, Irving T.; Jen, Teh-Sen; and Pricer, W. David, 3,697,962.

Jennings, John D.: *See—*
Anderson, Aldin R.; Jennings, John D.; and Killerby, Walter E., 3,696,986.

Jensen, Erik Kjaer, to Bristol-Myers Company. Heat storing hair roller. 3,696,819, Cl. 132-33.00r.

Jensen, Preben W. Rolling joint mechanisms. 3,696,683, Cl. 74-89.

Jessep, Donald C., Jr.: *See—*
Carter, William C.; Duke, Keith A.; and Jessep, Donald C., Jr., 3,697,949.

Jobert, Raymond: *See—*
Allirot, Rene Joseph; Darcas, Claude; and Jobert, Raymond, 3,697,576.

Jochimsen, Dieter: *See—*
Kuehnle, Manfred R.; and Jochimsen, Dieter, 3,697,176.

John, E. Roy; and Laupheimer, Robert. Method and system for brain wave analysis. 3,696,808, Cl. 128-2.10b.

Johne, Hans; Schumann, Gunter; and Reichenberger, Kurt, to Veb Druckmaschinenwerk Planeta. Apparatus for regulating a color dosing device in relation to a color doctor roller. 3,696,743, Cl. 101-365.000.

Johns-Manville Corporation: *See—*
Bettinardi, Edward Robert, 3,697,447.

Johnson, Allan M.; and Gilman, Richard F., to CCI Aerospace Corporation. Electrodialysis demineralization apparatus. 3,697,410, Cl. 204-301.000.

Johnson, Allan M., to CCI Aerospace Corporation. Method and apparatus for regenerating the dialyzing fluid for an artificial kidney. 3,697,418, Cl. 210-22.000.

Johnson, Benjamin M.: *See—*
Coppinger, Eugene A.; and Johnson, Benjamin M., 3,697,436.

Johnson, Francis: *See—*
Parker, William L.; Johnson, Francis; and Martin, John, 3,697,542.

Johnson, Frederick R.; and Palmer, David R., to General Electric Company. Means for restricting vapor backstreaming in a diffusion pump. 3,697,195, Cl. 417-154.000.

Johnson, Frithiof V., to United States of America, Navy. Optical viewing system. 3,697,154, Cl. 350-174.000.

Johnson, James C., to Hunt Electronics Company. Light dimming system having multiple control units. 3,697,821, Cl. 317-148.500.

Johnson, Joseph A., to Jomar Industries, Inc. Closure device for multiple injection blow molding machine. 3,697,210, Cl. 425-168.000.

Johnson, Lemoine L.; and Timmons, William P., to Donaldson Company, Inc. Dust leak detector for air cleaner systems. 3,696,666, Cl. 73-118.000.

Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., to Phillips Petroleum Company. Selective isomerization employing metal arsenide catalyst. 3,697,448, Cl. 252-464.000.

Johnson, Matthey & Company Limited: *See—*
Darling, Alan Sydney, 3,696,502.

Johnson, Olin B.; and Labana, Santokh S., to Ford Motor Company. Epoxy resin and graded acrylic rubber-urethane-acrylate paint and painting process. 3,697,312, Cl. 117-93.310.

Johnson, Ray M. Waveguide power switch having alternating close shorting plates. 3,697,894, Cl. 333-7.000.

Johnson, Robert E.: *See—*
Senter, Louis; and Johnson, Robert E., 3,696,689.

Johnson, Robert H.: *See—*
Goodrich, Eugene A.; and Johnson, Robert H., 3,696,688.

Johnson, S. C., & Son, Inc.: *See—*
Davenport, Richard L.; and Niemiec, Gerald M., 3,696,977.

Johnson Service Company: *See—*
Bailey, James R.; Corbell, Paul I.; and Korta, Lawrence B., 3,697,989.
Bjornsen, Bjorn G.; and Atkinson, Louis D., 3,696,828.
Janu, George J., 3,696,830.
McLean, Michael B., 3,697,781.

Johnston, James Stewart, to Rosemount Engineering Company Limited. Control systems. 3,697,768, Cl. 307-31.000.

Johnstone, Crichton Lockhart; and Paton, John Woodhouse. Automatic lifting tongs. 3,697,118, Cl. 294-110.00r.

Jomar Industries, Inc.: *See—*
Johnson, Joseph A., 3,697,210.

Jones, Arthur Llewelyn, to Scovill Manufacturing Company. Invisible-type slide fastener. 3,696,473, Cl. 24-205.100.

Jones, Billy R.: *See—*
Christman, Willard A.; and Jones, Billy R., 3,697,814.

Jones, Thomas M.; and Frazier, Alva W., to Tennessee Valley Authority. Elimination of magnesium gels in liquid and suspension fertilizers derived from wet acid. 3,697,247, Cl. 71-34.000.

Jones, William S.; and Hacker, Philip S., to Westinghouse Electric Corporation. Airborne pulse doppler radar system. 3,697,993, Cl. 343-7.700.

Jonsson, Nils Gunnar, to Atlas Copco Aktiebolag. Drill string joint breaking means. 3,696,872, Cl. 173-149.000.

Jordan, William E., to Xerox Corporation. Plug-in vacuum and circuit system for electrostatic printing machines. 3,697,163, Cl. 355-3.000.

Joyce, Glover C., to Warner & Swasey Company, The. Coolant nozzle. 3,696,564, Cl. 51-356.000.

Joyner, Frederick B.; Cash, George O., Jr.; and Meyer, Max F., Jr., to Eastman Kodak Company. Decoratable polyolefin plastics. 3,697,465, Cl. 260-27.00r.

Jullien, Yves: *See—*
Maurice, Guy; and Jullien, Yves, 3,696,832.

Jump, Peter Alexander Edward; and Keegan, Barclay, to Davy and United Engineering Company, Limited. Manufacture of cylindrical bodies from metal powder. 3,697,261, Cl. 75-208.00r.

Jureit, John Calvin, to Automated Building Components, Inc. Support for panels and the like. 3,696,572, Cl. 52-173.000.

Kaasenbrood, Petrus J. C.: *See—*
Van Nassau, Petrus J. M.; Brand, Wilhelmus K.; and Kaasenbrood, Petrus J. C., 3,697,521.

Kaasenbrood, Petrus J.C., to Stamicarbon N.V. Process for separating off melamine from a hot synthesis gas mixture which contains melamine vapour. 3,697,519, Cl. 260-249.70p.

Kabel- und Mettallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Martin, Helmut, 3,696,882.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Terai, Akio; Kawamura, Eiji; Fukumoto, Hisashi; and Aoki, Hidekatsu, 3,696,879.

Kabushiki Kaisha Koparu: *See—*
Murata, Kingo; and Shinohara, Katsutoshi, 3,697,770.

Kabushiki Kaisha Ricoh: *See—*
Ohta, Wasaburo; and Soga, Setsuo, 3,697,172.
Ohta, Wasaburo, 3,697,268.

Kabushiki Kaisha Suwa Seikosho: *See—*
Miyashita, Kanji, 3,696,608.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Nozaki, Choji; Kono, Kiichi; Sakai, Toshikiko; and Kamigaito, Osami, 3,696,604.

Kabushikikaisha Tokyo Seizosho (Tokyo Keiki Seizosho Co., Ltd.): *See—*
Ohyama, Takashi; Kawashige, Akira; and Miyashita, Takeo, 3,697,991.

Kachavos, Louis J.: *See—*
Robbins, Robert; Whitty, Arthur R.; and Kachavos, Louis J., 3,697,876.

Kafitz, Peter H., to Ryan Aeronautical Co., The. Increased power electronically scanning integrated antenna system. 3,697,995, Cl. 343-100.0sa.

Kaiser Aluminum & Chemical Corporation: *See—*
Ross, Richard J.; and Tjon, Harry X., 3,697,205.

Kalinsky, Harry. Wrist band and buckle therefor. 3,696,469, Cl. 24-71.00j.

Kalle Aktiengesellschaft: *See—*
Busch, Walter; Kramer, Heinz; Lind, Erwin; and Messner, Dieter, 3,697,303.
Herrmann, Heinz, 3,697,274.

Kallio, Oliver C. Snow displacing device with rototable blade casing. 3,696,535, Cl. 37-43.00c.

Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, to Societe Anonyme dite: L'Oreal. Dyeing hair with N-(ureidoalkyl)-and N-(thioureidoalkyl)-para-phenylene diamines. 3,697,215, Cl. 8-10.200.

Kamachi, Shin-Ichi, to Olympus Optical Co., Ltd. Method and microscope for detecting the position of a workpiece. 3,697,761, Cl. 250-222.000.

Kamigaito, Osami: *See—*
Nozaki, Choji; Kono, Kiichi; Sakai, Toshikiko; and Kamigaito, Osami, 3,696,604.

Kaminsky, Abraham R. Instrument for purifying sounds through sympathetic vibration. 3,696,698, Cl. 84-173.000.

Kamiyoshi, Masaya: *See—*
Kurihara, Osamu; Kuramoto, Naoya; Kamiyoshi, Masaya; and Yamaguchi, Takeshi, 3,697,310.

Kanbar, Maurice S.; and Benenati, Salvatore. Patty-forming device. 3,697,036, Cl. 249-74.000.

Kanda, Kimio; and Ono, Kunio, to Hitachi, Ltd. Automatic non-destructive case depth measuring instrument. 3,697,866, Cl. 324-34.00r.

Kane, James F., to Signetics Corporation. Three state output logic circuit with bistable inputs. 3,697,775, Cl. 307-209.000.

Kaneko, Hisashi, to Nippon Electric Company, Limited. Multilevel code conversion system. 3,697,874, Cl. 325-38.00a.

Kango Electric Hammers Limited: *See—*
Roje, Albert Norman, 3,697,792.

Karikomi, Masahiro: *See—*
Koyama, Masaki; Shimada, Sadakuni; and Karikomi, Masahiro, 3,698,001.

Karll, Robert E.: *See—*
Piasek, Edmund J.; and Karll, Robert E., 3,697,574.

Karste, Eberhard: *See—*
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.

Kartridg Pak Co., The: *See—*
Leonard, George E., 3,696,493.

Kashiwa Asechiren Kogyo Kabushiki Kaisha: *See—*
Hori, Shojiro; and Maruta, Hisao, 3,697,240.

Kasner, William. Calculator. 3,696,995, Cl. 235-139.00r.

Kassel, Aaron; and Kopelman, Donald F., to Technicon Instruments Corporation. Method and apparatus for the time sharing of multiple channel analysis means. 3,697,185, Cl. 356-181.000.

Katamay, Myron M.: *See—*
Khan, Mahmood H.; and Katamay, Myron M., 3,697,651.

Kato, Yoshiaki; and Ohuye, Hideki, to Citizen Watch Co., Ltd. Mechanical oscillator. 3,697,789, Cl. 310-9.500.

Katsurogawa Denki Kabushiki Kaisha: *See—*
Furuichi, Masayoshi; and Konuma, Takaaki, 3,697,722.

Katsuyama, Harumi: *See—*
Ono, Hisatake; Osada, Chiakai; Watarai, Syu; and Katsuyama, Harumi, 3,697,266.

Katsuyama, Takehiro: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Takimoto, Hisao, 3,697,637.

Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Takimoto, Hisao, to Mitsubishi Rayon Co., Ltd. Method for producing highly crimped regenerated cellulose fibers by steam stretching. 3,697,637, Cl. 264-168.000.

Kawai, Kazuo: *See—*
Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, 3,697,881.

Kawaki, Katsumi; and Usui, Masashi, to Tokyo Tokei Seizo Kaisha, Ltd. Tone control signal circuit having tone pulses followed by continuous tone. 3,697,982, Cl. 340-384.00e.

Kawamura, Eiji: *See—*
Terai, Akio; Kawamura, Eiji; Fukumoto, Hisashi; and Aoki, Hidekatsu, 3,696,879.

Kawase, Shinji; and Sumitomo, Norishige, to Precision Fukuhara Works, Ltd. Variable needle selecting means for knitting machines. 3,696,640, Cl. 66-40.000.

Kawashige, Akira: *See—*
Ohyama, Takashi; Kawashige, Akira; and Miyashita, Takeo, 3,697,991.

Kawashima, Toshihide: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Kealy, Wellesley Ashe, to United Kingdom Atomic Energy Authority. Digital actuators. 3,697,979, Cl. 340-347.0da.

Kearns, Michael I. Steam generating apparatus. 3,696,794, Cl. 122-235.00r.

Keegan, Barclay: *See—*
Jump, Peter Alexander Edward; and Keegan, Barclay, 3,697,261.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Photocurable liquid polyene-polythiol polymer. 3,697,395, Cl. 204-159.140.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R. & Co. Photocurable liquid polyene-polythiol polymer composition. 3,697,396, Cl. 204-159.140.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. High energy curable liquid polyene-polythiol polymer composition. 3,697,397, Cl. 204-159.140.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Photocurable liquid polyene-polythiol polymer composition. 3,697,402, Cl. 204-159.140.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Chemically curable liquid polyene-polythiol polymer composition. 3,697,621, Cl. 260-858.000.

Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Chemically curable liquid polyene-polythiol polymer composition. 3,697,622, Cl. 260-858.000.

Kelly, Robert G. Carpet installation system for use in an aircraft. 3,696,461, Cl. 16-16.000.

Kelvin Research Corporation: *See—*
Nisenson, Jules, 3,697,168.

Kemmetmueller, Roland, to American Waagner Biso Company, Inc. Method and apparatus for pollution-free charging of coke ovens. 3,697,381, Cl. 201-40.000.

Kemp, Frederick O. Noise-free electrical resistor. 3,697,920, Cl. 338-121.000.

Kempema, James L.; and Foard, Ralph W., to Lear Siegler, Inc. Method and apparatus for determining maximum allowable jet engine pressure ratios. 3,697,731, Cl. 235-150.200.

Kempermann, Theo: *See—*
Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,697,433.

Kempton, Marvin L.: *See—*
Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., 3,696,750.

Kempton, Marvin L., to United States of America, Navy, mesne. Rod warhead. 3,696,751, Cl. 102-67.000.

Kendall Company, The: *See—*
Laakso, Perttu V., 3,697,626.
Taylor, Glenn N., 3,696,443.

Kennedy, Ralph C.; and Torning, Ralph R., to Colt Industries Operating Corporation, mesne. Cylinder locking mechanism. 3,696,543, Cl. 42-67.000.

Kentucky Electronics Inc.: *See—*
Blumenberg, Horst H.; and Francillon, Francis W., 3,696,491.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Doose, Conrad; and Sassin, Wolfgang, 3,697,665.

Kernick, Andress; and Ernsberger, Glenn W., to Westinghouse Electric Corporation. Hysteresis-loop control for a power transformer. 3,697,855, Cl. 321-9.00a.

Kessel, Alvan A.: *See—*
Orth, Edward D.; and Kessel, Alvan A., 3,697,919.

Kessler, Bernard V.: *See—*
Erickson, Allen M.; and Kessler, Bernard V., 3,697,182.

Kessler, Warren W. Traveling chamber internal combustion engine. 3,696,797, Cl. 123-8.090.

Keto, August I.; and Farley, James R., to Westinghouse Electric Corporation. Electrical connector. 3,697,932, Cl. 339-111.000.

Khan, Mahmood H.; and Katamay, Myron M., to Fats and Proteins Research Foundation, Inc., mesne. Salmonellacide composition containing propionic acetic and butyric or phosphoric acids. 3,697,651, Cl. 424-128.000.

Khelghatian, Habet M.: *See—*
Poppe, Wassily; and Khelghatian, Habet M., 3,696,665.

Khrenov, Konstantin Konstantinovich; and Chudakov, Vyacheslav Andreevich, to Institut Elektrosvarkiimeni E. O. Patona. Multiturn inductor for magnetic-pulse treatment of tubular members. 3,697,914, Cl. 336-62.000.

Kidde, Walter, & Company, Inc., mesne: *See—*
Sung, Fu-Tien, 3,696,712.

Kienberger, Charles A.: *See—*
Petit, George S.; and Kienberger, Charles A., 3,697,441.

Kilgore, Lee A.; and Demerdash, Nabeel A., to Westinghouse Electric Corporation. Rotor for dynamoelectric machines. 3,697,791, Cl. 310-111.000.

Killerby, Walter E.: *See—*
Anderson, Aldin R.; Jennings, John D.; and Killerby, Walter E., 3,696,986.

Kilner, Olive H., to Texas Instruments, Incorporated. Overcurrent protection system and sensor used therewith. 3,697,863, Cl. 323-20.000.

Kim, Sung Chul, to International Telephone & Telegraph Corporation. Inner-outer finner heat transfer tubes. 3,696,863, Cl. 156-179.000.

Kim, Sunyong P. Combination camper vehicle and boat. 3,696,953, Cl. 214-450.000.

Kimberly-Clark Corporation: *See—*
Schwarz, Eckhard C. A., 3,697,367.

Kimura, Shiro; Sadao, Ishige; and Kobayashi, Teruo, to Fuji Photo Film Co., Ltd. Chromenopyrazol and process for preparation thereof. 3,697,540, Cl. 260-310.00r.

Kimura, Shoji: *See—*
Fukuoka, Ichiro; Kimura, Shoji; Nishimura, Takehiko; and Takahashi, Satoshi, 3,697,609.

Kimura, Yoshio: *See—*
Fujimuto, Yoshihisa; Kimura, Yoshio; Terasaki, Iwao; and Kitago, Takanobu, 3,697,230.

Kinetic Technologies, Inc.: *See—*
Teller, Alvin N., 3,696,548.

King, Frank O., to Phillips Petroleum Company. Nonglare photographic prints. 3,697,277, Cl. 96-50.0pl.

King, Harry J., to Hughes Aircraft Company. Ion beam deflection system. 3,697,793, Cl. 313-63.000.

King, Ian Robert: *See—*
Bayne, John; King, Ian Robert; and Morey, John Richard, 3,697,550.

Kira, Hiroshi, to General Telephone Company of California. Interior modular panel assemblies. 3,696,855, Cl. 160-135.000.

Kirshenbaum, Isidor: *See—*
Spenadel, Lawrence; Hall, Homer J.; and Kirshenbaum, Isidor, 3,697,455.

Kish, Donald Eugene; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Single wall domain memory organization. 3,697,963, Cl. 340-174.0tf.

Kisker, Laurence J.; and Mathewson, William G., to Clement, J. W., Company. Method for making multiple image electrotype molds. 3,697,657, Cl. 264-293.000.

Kisner, Lester A.: *See—*
Mellon, Eugene P.; and Kisner, Lester A., 3,696,848.

Kissinger, Lewis E., to United States of America, Navy. Flooder. 3,696,747, Cl. 102-10.

Kitago, Takanobu: *See—*
Fujimuto, Yoshihisa; Kimura, Yoshio; Terasaki, Iwao; and Kitago, Takanobu, 3,697,230.

Kitano, Shin; and Momose, Yutaka, to Aisin Seiki Kabushiki Kaisha. Forward reverse and brake inching control. 3,696,897, Cl. 192-4.00c.

Kitchener, Charles J.; and Rumball, Paul G., to USM Corporation. Means for transferring successive flexible work pieces. 3,696,942, Cl. 214-1.0bb.

Kittredge, Thomas D.: *See—*
Pressman, Gerald L.; and Kittredge, Thomas D., 3,697,164.

Klaas, Ruth Elizabeth Barry: *See—*
Blaisdell, Donald Stapf; and Klaas, Ruth Elizabeth Barry, 3,697,420.

Klaiber, Max: *See—*
Kundt, Edmund; Klaiber, Max; Leitz, Wilfried; and Vom Rath, Herbert, 3,696,955.

Klasson, George A.: *See—*
Robba, William A.; and Klasson, George A., 3,697,721.

Klausner, Arnold, to United States of America, Army. Munition burst detection system and method. 3,697,988, Cl. 343-5.00r.

Kleesattel, Claus, to Cavitron Corporation. Vibration sensor utilizing eddy currents induced in member vibrating in the field of magnet. 3,697,867, Cl. 324-40.000.

Kleinpeter, Joseph A.: *See—*
Young, Gary Clifford; and Kleinpeter, Joseph A., 3,696,587.

Kleptz, James A.; and Bissell, George H., to United States of America, Navy, mesne. Servo compensation for inertia change. 3,697,992, Cl. 343-7.0ed.

Kliehe, Helmut: *See—*
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.

Klienhaus, Clarence H.: *See—*
Hobson, Willis S.; Gregory, John T.; and Klienhaus, Clarence H., 3,697,388.

Klimek, Boleslaw: *See—*
Berg, Arthur A.; and Klimek, Boleslaw, 3,696,711.

Klinchuch, John F., to North American Rockwell Corporation. Electrostatic gyroscope suspension system. 3,697,143, Cl. 308-10.000.

Klinger, Friedrich, to Schenck, Carl, Maschinenfabrik GmbH. Force applying apparatus. 3,696,663, Cl. 73-91.000.

Kllian, Henry R., to Walworth Company. Dual action butterfly valve. 3,697,042, Cl. 251-163.000.

Knapp, Lowell W.: *See—*
Greenfield, Stephen J.; Howard, Anthony; and Knapp, Lowell W., 3,697,063.

Knight, Edgar: *See—*
Cooper, Cyril Walker, 3,697,055.

Knight, Rodney W.; Martin, Melvin M.; and Martin, William R., to United States of America, Atomic Energy Commission. Gradient-type nuclear fuel plate. 3,697,374, Cl. 176-69.000.

Knight, Sheldon; and McCarron, Kerwin Peter, to Quantic Industries, Inc. Optical apparatus using slitted marks for detecting rotary motion of object. 3,697,183, Cl. 356-114.000.

Knisse, Gerhard: *See—*
Heine, Olaf; and Knisse, Gerhard, 3,696,623.

Knopp, Paul V.: *See—*
Teletzke, Gerald H.; Knopp, Paul V.; and Erickson, Allen H., 3,697,417.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Strong durable press cellulosic fabrics. 3,697,307, Cl. 117-56.000.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Certain substituted cyclohexyl amines. 3,697,594, Cl. 260-563.00r.

Kobayashi, Teruo: *See—*
Kimura, Shiro; Sadao, Ishige; and Kobayashi, Teruo, 3,697,540.

Kobayashi, Tsuyoshi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.

Koch, Wolf H., to Ford Motor Company. Controller for variable reluctance motor. 3,697,840, Cl. 318-138.000.

Kochevar, John W., to Continental Can Company, Inc. Carton having novel interlocked corner constructions. 3,696,989, Cl. 229-34.000.

Kochs Adler AG: *See—*
Bernewasser, Horst, 3,696,765.
Landwehr, Gunter, 3,696,767.

Koeble, Earl A.: *See—*
Grunewalder, Valentine J.; and Koeble, Earl A., 3,697,618.

Koenig, Elmer A.: *See—*
Penniman, Allen; and Koenig, Elmer A., 3,696,916.

Koivunen, Erkki A., to General Motors Corporation. Brake and cooling system. 3,696,893, Cl. 188-264.00e.

Kojima, Mikiharu; and Iwata, Tetuo, to Tokyo Shibaura Electric Co., Ltd. Driving mechanisms for moving stairways. 3,696,909, Cl. 198-16.000.

Kojima, Takakazu: *See—*
Fujisawa, Tamotsu; and Kojima, Takakazu, 3,697,601.

Kokalari, Albert: *See—*
Noakes, Thomas E.; Konen, Thomas P.; Kokalari, Albert; and Duggan, Robert B., 3,696,611.

Kokusai Denki Kabushiki Kaisha: *See—*
Murai, Tsuyoshi; and Toi, Tatsuo, 3,696,779.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, 3,697,881.

Kolb, Peter: *See—*
Pollak, Gottfried; and Kolb, Peter, 3,697,667.

Kolling Heinrich: *See—*
Kurz, Jurgen; Kolling Heinrich; and Federmann, Manfred, 3,697,517.

Kominklyke Nederlandsche Hoogodns en Staalfabrieken N. V.: *See—*
Van Wierst, Wilhelmus Lambertus; and Paffen, Pieter Jozef Marie, 3,697,119.

Konen, Thomas P.: *See—*
Noakes, Thomas E.; Konen, Thomas P.; Kokalari, Albert; and Duggan, Robert B., 3,696,611.

Konewko, Joseph E.; and Occhipinti, Carl, to Bunker-Ramo Corporation, The. Controlled insertion force receptacle for flat circuit bearing elements. 3,697,929, Cl. 339-75.0mp.

Kongelka, Robert Michael, to Viewlex, Inc., mesne. Leak-proof fluid coupling. 3,696,899, Cl. 192-58.00b.

Kono, Kiichi: *See—*
Nozaki, Choji; Kono, Kiichi; Sakai, Toshikiko; and Kamigaito, Osami, 3,696,604.

Konrad, Frederic M.: *See—*
Freudewald, Joachim E.; and Konrad, Frederic M., 3,697,606.

Konuma, Takaaki: *See—*
Furuichi, Masayoshi; and Konuma, Takaaki, 3,697,722.

Kopelman, Donald F.: *See—*
Kassel, Aaron; and Kopelman, Donald F., 3,697,185.

Kornrumpf, William P., to General Electric Company. Induction cooking power converter with improved coil position. 3,697,716, Cl. 219-10.490.

Kornrumpf, William P.; and Harnden, John D., Jr., to General Electric Company. Induction cooking appliance with multicylinder power circuits. 3,697,717, Cl. 2-10.490.

Korta, Lawrence B.: *See—*
Bailey, James R.; Corbell, Paul I.; and Korta, Lawrence B., 3,697,989.

Kostuch, Donald J.: *See—*
Bartholomew, Gerald E.; Kostuch, Donald J.; Robinson, Thomas E.; and Rohland, William S., 3,697,951.

Kosubek, Uwe: *See—*
Hertel, Hasso; Gehre, Kurt; Lowenfeld, Rudolf; and Kosubek, Uwe, 3,697,216.

Kosziech, Karl-Heinz; and Teschner, Kurt, to Dornier A.G. Rotor mast support for helicopters. 3,697,024, Cl. 248-15.000.

Kotter, James I.: *See—*
Mayer, Mayer, Jr.; Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,600.

Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., to United States of America, Agriculture. Electrostatic fiber collecting and yarn spinning apparatus. 3,696,603, Cl. 57-58.890.

Kough, John K.; Martin, Otis M.; and Miller, Silas N., to Ditz-Crane. Building panel enclosures for valley and hip structures. 3,696,570, Cl. 52-127.000.

Kouwenhoven, Herman Wouter: *See—*
Van Klinken, Jakob; Kouwenhoven, Herman Wouter; and Van Weeren, Pieter Aldert, 3,697,444.

Kovalcik, John N.; and Hovis, Donald B., to Medipak Corporation Limited. Container for surgical instruments and appliances. 3,697,223, Cl. 21-83.00.

Kowalski, Leon. Camper unit lifting device. 3,697,044, Cl. 254-45.000.

Koyama, Masaki; Shimada, Sadakuni; and Karikomi, Masahiro, to Nippon Telegraph and Telephone Public Corporation. Frequency group separation filter device using laminated dielectric slab-shaped elements. 3,698,001, Cl. 343-909.000.

Kozacka, Frederick J.: *See—*
Belcher, Richard A.; and Kozacka, Frederick J., 3,697,916.

Kozlikov, Vadim Lvovich: *See—*
Mironov, Vladimir Florovich; Fedotov, Nikolai Semenovich; and Kozlikov, Vadim Lvovich, 3,697,569.

Kozlov, Ivan Ivanovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav

Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Kozlov, Lev Ivanovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Kraft, Ben F.: *See—*
Phelps, Thomas E.; and Kraft, Ben F., 3,697,039.

Kraftco Corporation: *See—*
Breidenstein, Kenneth R., 3,697,293.

Krafthefer, Kerry M., to Molex Products Company. Plural circuit board connecting arrangement and terminal therefor. 3,697,926, Cl. 339-17.00l.

Krall, Albert D.: *See—*
Anderson, Wallace E.; Krall, Albert D.; and Syeles, Albert M., 3,697,831.

Kramer, Heinz: *See—*
Busch, Walter; Kramer, Heinz; Lind, Erwin; and Messner, Dieter, 3,697,303.

Krantz, Walter. Door lock mounting bracket. 3,697,107, Cl. 292-337.000.

Kranyik, Robert Donald; Vegliante, Donald E.; and Balmer, Donald F., to Learning Systems Corporation. Teaching machine. 3,696,524, Cl. 35-9.00c.

Krause, John L. Blind rivet for tieing heat insulation liner in air conduit. 3,696,702, Cl. 85-77.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Herbst, Richard, 3,697,212.

Krekeler, Claude B., to Cincinnati Mine Machinery Co. Resilient mounting for cutting tools of mining machines and the like. 3,697,137, Cl. 299-86.000.

Krengel, Theodore H.; Ostrowski, Arthur E.; and Raymond, Anthony J., to Allied Tube & Conduit Corporation. Method and apparatus for continuously galvanizing steel strip. 3,696,503, Cl. 29-527.400.

Krikorian, Garo H., to Hi-Flux Corporation. Drier for paper webs. 3,696,522, Cl. 34-115.000.

Krone G.m.b.H.: *See—*
Krone, Heinz; and Hoffmann, Wilhelm, 3,696,992.

Krone, Heinz; and Hoffmann, Wilhelm, to Krone G.m.b.H. Savings bank insertion slot safety mechanism. 3,696,992, Cl. 232-4.000.

Kropp, Rudolf: *See—*
Reicheneder, Franz; Kropp, Rudolf; and Fischer, Adolf, 3,697,522.

Kruck, Henry: *See—*
Mrugala, Theodore A.; and Kruck, Henry, 3,696,487.

Kucera, Alfred J.; and Pulley, Monroe, Jr. Shoe cleaning mat assembly. 3,696,459, Cl. 15-104.920.

Kudo, Atsushi: *See—*
Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, 3,696,622.

Kudo, Mitsuhiro: *See—*
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.

Kuehner, Mark A., to Amchem Products, Inc. Method for coating aluminum while avoiding objectionable wastes. 3,697,332, Cl. 148-6.15r.

Kuehnle, Manfred R.; and Jochimsen, Dieter, to Audac Corporation. System for recording data on microfiche and for viewing and making prints of the recorded data. 3,697,176, Cl. 355-5.000.

Kulka Electric Corporated: *See—*
Drapkin, William B., 3,697,935.

Kulson, Walter A. Adjustable height and variable force clamp. 3,697,060, Cl. 269-228.000.

Kummerer, Karl-Heinz, to Telefunken Patentverwertungsgesellschaft m.b.H. Apparatus for producing an orderly stack of flat items. 3,697,064, Cl. 271-5.000.

Kundt, Edmund; Klaiber, Max; Leitz, Wilfried; and Vom Rath, Herbert, to Ciba-Geigy AG. Container closure. 3,696,955, Cl. 215-9.000.

Kunkle, James Raymond: *See—*
Kunkle, John Philip; and Kunkle, James Raymond, 3,697,927.

Kunkle, John Philip; and Kunkle, James Raymond, to AMP Incorporated. Electrical connectors and housings therefore. 3,697,927, Cl. 339-19.000.

Kunst, Detlef: *See—*
Werner, Georg; and Kunst, Detlef, 3,696,907.

Kuramoto, Naoya: *See—*
Kurihara, Osamu; Kuramoto, Naoya; Kamiyoshi, Masaya; and Yamaguchi, Takeshi, 3,697,310.

Kurath, Paul; and Egan, Richard Stephan, to Abbott Laboratories. Erythronolide B derivatives. 3,697,547, Cl. 260-343.000.

Kureha Kagaku Kogy Kabushiki Kaisha: *See—*
Shinoda, Kiyonori; Watanabe, Tadayoshi; and Mizusawa, Shigeru, 3,697,443.

Kurihara, Osamu; Kuramoto, Naoya; Kamiyoshi, Masaya; and Yamaguchi, Takeshi, to Teijin Limited. Method of bonding polyester synthetic fibrous material to rubber compound. 3,697,310, Cl. 117-76.00t.

Kuriu, Sadao: *See—*
Uchida, Koji; and Kuriu, Sadao, 3,697,304.

Kurosawa, Kenjiro: *See—*
Masuda, Tetuzo; Kurosawa, Kenjiro; Hashimoto, Takeo; and Izumi, Takahisa, 3,696,730.

Kurtz, Stewart Kendall, to North American Philips Corporation. Photo electric switching device. 3,697,762, Cl. 250-239.000.

Kurz, Jurgen; Kolling Heinrich; and Federmann, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. 1,3-Benzoxazines. 3,697,517, Cl. 260-244.00r.

Kuts, Mathew, to Goodrich, B. F., Company, The. Manufacture of windshield wiper blades. 3,697,356, Cl. 156-467.000.

Kvaerner Brug A/S: *See—*
Ostrem, Halvor, 3,696,774.

Kyodo Chemical Company Limited: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.

Kyorin Geiyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, 3,697,577.

Kyriakis, John; and Tole, Walter Roland, to Beta Instrument Company Limited. Method for annealing flexible metallic material. 3,697,335, Cl. 148-154.000.

Kyritsis, William T.; and Simmonds, Robert C., Jr., to USM Corporation. Apparatus for injection molding articles of foam material. 3,697,204, Cl. 18-30.0cr.

Kyser, Leslie T.: *See—*
Booth, William C.; and Kyser, Leslie T., 3,697,734.

La Beck, Keith E., to Esco Corporation. Log grapple. 3,697,115, Cl. 294-88.000.

La Cagnina, John M.; and Davies, Robert G., to Xerox Corporation. Prevention of arcing in an electrode imaging system. 3,697,407, Cl. 204-300.

Laakso, Perttu V., to Kendall Company, The. N-phosphylaminoethyl phosphate. 3,697,626, Cl. 260-926.000.

Labana, Santokh S.: *See—*
Johnson, Olin B.; and Labana, Santokh S., 3,697,312.

Lachman, Rudolf: *See—*
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.

Laff, Robert A.: *See—*
Cuomo, Jerome J.; and Laff, Robert A., 3,697,343.

Lafleur, Clovis L., to Schlumberger Technology Corporation. Methods and apparatus for acoustic logging in cased well bores. 3,696,884, Cl. 181-.5bi.

Lagally, Paul, to United States of America, Navy. Bearings comprising polyolefins and an imine modified carbon black compound. 3,697,425, Cl. 252-12.000.

Lagally, Paul, to United States of America, Navy. Polyolefins containing an imine modified carbon black compound. 3,697,476, Cl. 260-41.00r.

Lahay, Charles Arthur, to International Paper Company. Device for organizing objects. 3,696,920, Cl. 206-63.20r.

Laiderman, Donald David, to Gillette Company, The. Cosmetic composition. 3,697,644, Cl. 424-70.000.

Lamorte, Michael F., to RCA Corporation. Method of making semiconductor devices. 3,697,336, Cl. 148-171.000.

Lampredi, Aurelio, to Fiat Societa per Azioni and Cigala & Bertinetti S.a.s. Toothed pulleys. 3,696,685, Cl. 74-230.300.

Lancaster, Robert W., to Panhandle Eastern Pipe Line Company. Dies for cutting electrical cable. 3,696,509, Cl. 30-90.600.

Landwehr, Gunter, to Kochs Adler AG. Intersectindevice for sewing machine. 3,696,767, Cl. 112-130.000.

Lane, Lamcolm S.: *See—*
Erekson, Arthur B.; and Lane, Lamcolm S., 3,696,847.

Langdon, Jack L.: *See—*
Feinberg, Irving; Langdon, Jack L.; and Sitler, Carl L., 3,697,318.

Lange, Karl Heinz, to Balda-Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft. Adjustable camera-objective. 3,696,725, Cl. 95-45.000.

Langner Domes Ltd.: *See—*
Langner, Horst Egon Phillip, 3,696,566.

Langner, Horst Egon Phillip, to Langner Domes Ltd. Sphere-dome construction. 3,696,566, Cl. 52-80.000.

Laporte Industries Limited: *See—*
Bayne, John; King, Ian Robert; and Morey, John Richard, 3,697,550.

Lara, Eusebio Rodriquez. Hair-curling device. 3,696,820, Cl. 132-40.000.

Lara, Raul: *See—*
Gluck, Julius; and Lara, Raul, 3,696,908.

Larew, John J., to General Electric Company. Font selecting system. 3,697,958, Cl. 340-172.500.

Larosa, Charles N.: *See—*
Simms, Bernard B.; Stein, Alvin A.; and Larosa, Charles N., 3,696,621.

Larrison, Millard S.: *See—*
Rattenbury, Kenneth; and Larrison, Millard S., 3,697,627.

Larson, Clarence E.; and Schneider, Harold G., to Marietta-Martin Corporation. Lifting tongs. 3,697,117, Cl. 294-106.000.

Larson, Harry T.; and Loewe, Richard T. Encoding device. 3,697,687, Cl. 178-18.000.

Larson, Marlow W. Range finder and bow sight device. 3,696,517, Cl. 33-265.000.

Lass, James L.: *See—*
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, 3,697,376.

Lattion, Andre, to Rieter Machine Works Ltd. Double apron drafting arrangement for spinning machines. 3,696,468, Cl. 19-55.000.
Lauck, Robert M., to Stauffer Chemical Company. Using salvage cheese in preparing pasteurized process cheese. 3,697,292, Cl. 99-115.000.
Lauffer, Fred E., to Owens-Illinois, Inc. Supporting pad for a pallet. 3,697,029, Cl. 248-188.800.
Laupheimer, Robert: *See—*
John, E. Roy; and Laupheimer, Robert, 3,696,808.
Laur Knudsen, Nordisk Elektricitets Selskab: *See—*
Frederiksen, Erik, 3,697,736.
Laurent, Robert Parker: *See—*
Lester, Frank Backus; Laurent, Robert Parker; and Titemore, Robert George, 3,696,704.
Lauria, Andrew Carmine; and Owens, Jeffrey Lynn, to Miles Laboratories, Inc. Cyanide removal from waste effluents. 3,697,421, Cl. 210-59.000.
Lawford, Victor Nicholas, to International Telephone and Telegraph Corporation. Instrument pressure calibration method and apparatus. 3,696,659, Cl. 73-4.00r.
Lawrence, Leslie: *See—*
Rotondo, Fortunato N.; Toledo, Emil; and Lawrence, Leslie, 3,696,846.
Lawrence, Thomas R.; and Saltzberg, Burton R., to Bell Telephone Laboratories, Incorporated. Digital frequency-shift modulator using a read-only-memory. 3,697,892, Cl. 332-9.00r.
Lazar, Joseph H. Method and apparatus for granulating wax. 3,697,004, Cl. 241-27.000.
Lazarus, Stanley D.: *See—*
Balint, Laszlo J.; Lazarus, Stanley D.; and Russell, William N., 3,697,579.
Le Mere, Roger: *See—*
Brown, Fred A., III; and Le Mere, Roger, 3,697,354.
Le Tarte, Frank M. Panel and frame assembly. 3,696,857, Cl. 160-371.000.
Lear Siegler, Inc.: *See—*
Anthony, Russell W., 3,697,092.
Kempema, James L.; and Foard, Ralph W., 3,697,731.
Tutt, Richard D., 3,696,731.
Learning Systems Corporation: *See—*
Kranyik, Robert Donald; Vegliante, Donald E.; and Balmer, Donald F., 3,696,524.
Leat, Andrew Francis Vincent, to Elliott Brothers (London) Limited. Vehicle direction sensing and steering systems using magnetic flux responsive means. 3,696,518, Cl. 33-357.000.
Leblond, Jean; and Biet, Jean, to Uniroyal Englebert France S.A. Load transfer apparatus. 3,696,949, Cl. 214-16.40a.
Leder, Lewis B.: *See—*
Adams, James E.; and Leder, Lewis B., 3,697,152.
Lee, Hong Man, to U. S. Plywood-Champion Papers Inc. Gas venting liquid retaining closure. 3,696,958, Cl. 215-56.000.
Lee, Joo Chan, to Safety Company, The. System for monitoring chassis potential and ground continuity. 3,697,808, Cl. 317-18.00a.
Lee, Leonard S.; Uyeda, Yoshio; and Heneghan, Leo F., to Merck & Co., Inc. Magnesium oxide coatings. 3,697,322, Cl. 117-234.000.
Lee, Paul H.; and Skolnick, Michael L., to Perkin-Elmer Corporation, The. Laser frequency stabilization system and method. 3,697,887, Cl. 331-94.500.
Lee, Tzuo-Chang, to Honeywell Inc. Heterodyne readout holographic memory. 3,698,010, Cl. 340-174.0yc.
Leeds & Northrup Company: *See—*
MacMullan, Samuel J., 3,697,871.
Leeds, Michael T.: *See—*
Wakley, Wilbur T.; and Leeds, Michael T., 3,697,666.
Lehmann, Leonard T., to Hercules Incorporated. Process of preparing air-pervious spot bonded nonwoven fabrics. 3,697,347, Cl. 156-81.000.
Lehmbeck, Donald R., to Xerox Corporation. Apparatus for evaluating the recording characteristics of a thermoplastic photoreceptor. 3,697,184, Cl. 356-175.000.
Leifer, Noel Arthur; and Ott, Henry Walter, to Bell Telephone Laboratories, Incorporated. Tape loading and unloading mechanism. 3,697,016, Cl. 242-189.000.
Leifheit, Gunter; and Liebscher, Johannes, to Leifheit International Gunter Leifheit KG. Cleaning apparatus. 3,696,458, Cl. 15-50.00c.
Leifheit International Gunter Leifheit KG: *See—*
Leifheit, Gunter; and Liebscher, Johannes, 3,696,458.
Leisure Products, Inc.: *See—*
Sarno, Richard L., 3,697,048.
Leitz, Wilfried: *See—*
Kundt, Edmund; Klaiber, Max; Leitz, Wilfried; and Vom Rath, Herbert, 3,696,955.
L'Electro-Refractoire: *See—*
Recasens, Joseph, 3,697,037.
Leng, Douglas E.: *See—*
Harmer, David E.; Jarema, John R.; and Leng, Douglas E., 3,697,351.
Lengnick, Gunther F.; and Pande, Kailash Chandra, to Stauffer-Wacker Silicone Corporation, mesne. Method for curing an organopolysiloxane using a organotin aminocarbamate. 3,697,477, Cl. 260-46.5.
Lenz, David E.: *See—*
Meier, Eugene P.; Lenz, David E.; and Sternberger, Ludwig A., 3,697,645.
Leon, Edward: *See—*
Shatz, Malcolm H.; and Leon, Edward, 3,697,331.
Leonard, George E., to Kartridg Pak Co., The. Aerosol valve assembly locating and setting apparatus. 3,696,493, Cl. 29-208.00b.
Leontaritis, Lambis; Schon, Nikolaus; Hoffmann, Hans; and Sayed, Aziz El, to Farbenfabriken Bayer Aktiengesellschaft. Pretreatment of metal sheets which are coated after a forming operation. 3,696,498, Cl. 29-424.000.
Leontiev, Alexandr Ivanovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.
Lerner, Charlotte F., to Small World Importing Corporation. Christmas tree ornamentation package. 3,696,918, Cl. 206-45.310.
Lesare, Paul, to U.S. Philips Corporation. Television transmitter with the synchronization signal applied to the oscillation and the luminance signal applied to a modulator. 3,697,684, Cl. 178-7.200.
Lesher, George Y., to Sterling Drug Inc. N,N'-alkylene bis (pyridine-carboxamides). 3,697,531, Cl. 260-295.0am.
Lester, Frank Backus; Laurent, Robert Parker; and Titemore, Robert George, to General Electric Company. Ammunition bulk loader. 3,696,704, Cl. 89-34.000.
Letchworth, Herman R., to Seafoods Automation Corporation. Method and apparatus for positioning shrimp. 3,696,466, Cl. 17-91.000.
Leute, Richard K.; and Ullman, Edwin F., to Synvar Associates. 4,5-Dihydroimidazoline-3-oxide-1-oxyl. 3,697,535, Cl. 260-299.000.
Lever Brothers Company: *See—*
Boertje, Arie Leendert; and Philpott, Peter John, 3,696,735.
Priestley, Hill M., 3,697,587.
Tonsbeek, Christiaan Herman Theodoor, 3,697,291.
Van Den Ouweland, Godefridus Antonius Maria; and Peer, Henricus Gerardus, 3,697,295.
Levi, Elaine G. Tobacco pouch closure. 3,696,917, Cl. 206-41.00f.
Levine, Charles J.: *See—*
Teuscher, Leon A.; Trubisky, Michael P.; Palermiti, Frank M.; and Levine, Charles J., 3,697,265.
Levine, Sidney V.; and Hastalis, Christopher. Method and apparatus for making twelve-page booklets or signatures. 3,697,061, Cl. 270-5.000.
Levkoff, Henry S. Note pad holder with night light. 3,697,737, Cl. 240-6.40b.
Levy, Kenneth, to Singer Company, The. Film position and break detector. 3,696,981, Cl. 226-11.000.
Lewis, Donald E., to Ilex Optical Company, Inc. Shutter operating system. 3,696,726, Cl. 95-53.0ea.
Lewis, J. Stephen: *See—*
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.
Lewis, J. Stephen; Sapkus, Jurgis; and Villasana, Armando P., to Mattel, Inc. Object-holding hands for dolls. 3,696,553, Cl. 46-116.000.
Lewis, James M.; and Shirey, John E., to Horizons Incorporated. Polyvinylcarbazole photographic systems. 3,697,276, Cl. 96-48.000.
Lewis, William T.: *See—*
Elliott, Delbert R.; and Lewis, William T., 3,697,139.
Lhommelet, Robert: *See—*
Soffer, Jacques; and Lhommelet, Robert, 3,697,845.
Liautaud, John N.: *See—*
Amundsen, Paul D.; and Liautaud, John N., 3,696,442.
Libbey, Albert H.: *See—*
Gates, Percival T., Jr.; and Libbey, Albert H., 3,697,683.
Liberman, Harvey W.: *See—*
Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., 3,696,951.
Liberti, Frank N.: *See—*
Bialous, Charles A.; Campbell, Allen J.; and Liberti, Frank N., 3,697,481.
Lichtman, Irwin A.; and Woodward, Fred E., to Diamond Shamrock Corporation. Defoamer compositions containing organic particles. 3,697,440, Cl. 252-321.000.
Licitis, Gunars, to Glass, Marvin, & Associates. Phonograph index means. 3,697,086, Cl. 274-17.000.
Lieberman, Hillel, to Betz Laboratories, Inc. Fine paper mill defoamer and its use. 3,697,438, Cl. 252-321.000.
Lieberman, Hillel; Duharte-Francia, Carlos A.; and Henderson, John W., to Betz Laboratories, Inc. Composition for controlling foaming in aqueous systems and its method of use. 3,697,439, Cl. 252-321.000.
Lieberman, Hillel, to Betz Laboratories, Inc. Compositions for controlling foam in aqueous systems and its method of use. 3,697,442, Cl. 252-321.000.
Liebig, Preston D.; and Hurlbut, William B., Sr., to Combustion Engineering Inc. Adjustable air pollution control scrubber bed. 3,696,589, Cl. 55-233.000.
Liebscher, Johannes: *See—*
Leifheit, Gunter; and Liebscher, Johannes, 3,696,458.
Lilienkamp, Hugh: *See—*
Conn, James B.; Delbauve, J. Richard; and Lilienkamp, Hugh, 3,697,886.
Lilly, Eli, and Company: *See—*
Bach, Nicholas J.; and Farkas, Eugene, 3,697,558.

Lind, Erwin: *See—*
Busch, Walter; Kramer, Heinz; Lind, Erwin; and Messner, Dieter, 3,697,303.
Lindsay, John. Wind sock. 3,696,672, Cl. 73-189.000.
Lindstrom, Sven-Olof: *See—*
Weibull, Bengt J. G.; Thorsell, Leif Urban Folke; and Lindstrom, Sven-Olof, 3,697,598.
Linhardt, Hans D.: *See—*
Bryant, Gerald T.; Linhardt, Hans D.; and Nichols, Kenneth E., 3,696,975.
Liotta, Alfonso L. Golf practicing device. 3,697,080, Cl. 273-186.00r.
Lippmann, Wilbur, to Ayerst, McKenna and Harrison, Ltd. Method of treating hyperchlorhydria and/or associated conditions. 3,697,654, Cl. 424-330.000.
Liskey Aluminum Inc.: *See—*
Swensen, Eugene L.; and Gibson, Franklin E., 3,696,578.
Litt, Morton Herbert: *See—*
Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, 3,697,564.
Little, Arthur D., Inc.: *See—*
Wenckus, Joseph F., 3,697,228.
Little, David W., to General Electric Company. Static network protective relay. 3,697,811, Cl. 317-27.00r.
Little, Edwin D., to Allied Chemical Corporation. Pyrolysis of tris (2-carboxyethyl)-isocyanurate. 3,697,584, Cl. 260-486.
Littleton, Arnold B., to Gay Toys, Inc. Baseball helmet. 3,696,440, Cl. 2-3.00a.
Littleton, Arnold B., to Gay Toys, Inc. Racing helmet. 3,696,441, Cl. 2-3.00a.
Litton Systems, Inc.: *See—*
Anderson, Harold C.; and Graff, David F., 3,697,804.
Livingston, Richard D., to Amerock Corporation. Drawer slide assembly for self-closing drawer. 3,697,140, Cl. 308-3.800.
Livingston, Russell G. Spark plug shielding. 3,697,796, Cl. 313-134.000.
LKB Produkter AB: *See—*
Svendsen, Per Just, 3,697,406.
Lloyd, Harold B.; and Stewart, Sterling E. Water therapy safety controls. 3,696,996, Cl. 236-92.000.
Lodrick, Lester B.; and Teno, Vincent N. Coin packer. 3,696,582, Cl. 53-59.000.
Loewe, Richard T.: *See—*
Larson, Harry T.; and Loewe, Richard T., 3,697,687.
Lohrke, James L., Jr., to Turbo Machine Company. Process and apparatus for producing yarn. 3,696,467, Cl. 19-.370.
Lone, Peter R., to Honeywell Inc. Recorder with time line generator and interval encoder. 3,698,004, Cl. 346-23.000.
Long, Frank; and Ayad, Kamal Naguib, to Monsanto Chemicals Limited. Pyridines and phytotoxic compositions. 3,697,251, Cl. 71-94.000.
Longley, Miner R.: *See—*
Grant, John; and Longley, Miner R., 3,697,815.
Longswoth, Ralph C., to Air Products and Chemicals, Inc. Liquid cryogen transfer system. 3,696,627, Cl. 62-51.000.
Lonza Ltd.: *See—*
Moser, Kurt; and Hochli, Beat, 3,696,664.
Volker, Theodor; and Hering, Klaus, 3,697,583.
Loos, Edwin; and Caudle, James William, to Saskatchewan Government Insurance Office, The. Production of documentary evidence. 3,697,101, Cl. 283-62.000.
Lopas, Kasimir, to Time, Incorporated. Method and apparatus for cutting thermoplastic coated members. 3,696,708, Cl. 90-11.00c.
Loscalzo, Nicholas R. Nut lock. 3,696,646, Cl. 70-1.500.
Lotti, Louis B.: *See—*
Hocking, Loren P.; and Lotti, Louis B., 3,697,942.
Louvel, Guy, to Compagnie Industrelle des Telecommunication. Slotted microstrip line for impedance matching having two stops to prevent ohmic contact between the movable reactive element and the center strip. 3,697,902, Cl. 333-84.00m.
Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
Frederiksen, Erling Knud; and Godtfredsen, Wagn Ole, 3,697,507.
Lowe, Warren, to Chevron Research Company. Amines as antiwear additives in marine cylinder oils. 3,697,426, Cl. 252-42.700.
Lowenfeld, Rudolf: *See—*
Hertel, Hasso; Gehre, Kurt; Lowenfeld, Rudolf; and Kosubek, Uwe, 3,697,216.
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 50% to Data Packaging Corporation and 50% to Digital Information Devices, Inc. Tape handling mechanism for computer. 3,697,014, Cl. 242-182.000.
Lowry, Ray B.: *See—*
Crippa, Eugene R.; and Lowry, Ray B., 3,697,969.
Lox Equipment Company: *See—*
Eifel, Paul J.; and Cavanna, Cesar E., 3,696,959.
Lozach, Gerard: *See—*
Soulie, Guy; and Lozach, Gerard, 3,697,104.
LTV Electrosystems, Inc.: *See—*
Gluth, Norman P.; and Houghton, Richard A., 3,697,699.
Lubowitz, Hyman R.: *See—*
Vaughan, Robert W.; and Lubowitz, Hyman R., 3,697,345.
Lubowitz, Hyman R.; and Vaughan, Robert W., to TRW Inc. Boron reinforced polyimide composites. 3,697,308, Cl. 117-65.200.
Lubrizol Corporation, The: *See—*
Meinhardt, Norman A.; and Widmer, Robert, 3,697,428.
Lucas, Clyde M.: *See—*
Deming, Andrew Frank; and Lucas, Clyde M., 3,696,680.
Lucas, James M.; Suder, Jack K.; and Vander Wall, Eugene M., to Aerojet-General Corporation. Non-carbon forming monopropellant process using a lower alkylhydrazine and ammonia. 3,696,616, Cl. 60-218.
Lucas, Joseph, (Industries) Limited: *See—*
Hicks, Harris Vernon, 3,697,803.
Lucas, Joseph G.; and Zuryk, John, to Avco Corporation. Electrochemical milling process. 3,697,401, Cl. 204-143.00r.
Luce, David A.: *See—*
Clark, Melville, Jr.; and Luce, David A., 3,697,703.
Luckock, Glenn W.: *See—*
Hastings, Martin R.; and Luckock, Glenn W., 3,697,298.
Ludin, Ludwig, to Physikalisch-Technisches Entwichlungsburolaing. Demountable heat pump with hermetically sealed circuit. 3,696,634, Cl. 62-333.
Luedeman, Robert T., to Weston Instruments, Inc. Flow-line thermometer. 3,696,677, Cl. 73-343.00r.
Luedi, Mark: *See—*
Bennett, Raymond G.; and Luedi, Mark, 3,696,591.
Lukash, Leslie: *See—*
Mc Culler, James F., 3,697,639.
Lunden, Sidney L., to Moore-lem, Inc. Course formation apparatus. 3,696,911, Cl. 198-40.000.
Lundin, Andrew P.; and Milner, John D. Apparatus for comminuting articles. 3,697,005, Cl. 241-101.00m.
Lunn, Gerald K., to Motorola, Inc. Synchronous AM detector. 3,697,685, Cl. 178-7.30r.
Lushbaugh, Warren A.: *See—*
United States of America, National Aeronautics and Space Administration, 3,697,950.
Lustig, Claude D.: *See—*
Freyheit, Paul J.; and Lustig, Claude D., 3,697,797.
Lyland, James W.: *See—*
United States of America, National Aeronautics and Space Administration, 3,697,950.
Lynn, Charles C. High protein edible products and method of preparing same. 3,697,290, Cl. 99-86.000.
Lysle, Gordon; and Bonagura, Ronald, to Photosystems Corporation. Photographic recording and reproduction apparatus. 3,696,722, Cl. 95-18.00r.
M & T Chemicals Inc.: *See—*
Passal, Frank, 3,697,391.
Mabbutt, David Robert, to Rotadraw Limited. Drawing and teaching machine. 3,696,529, Cl. 35-26.000.
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co., Ltd. Starting switch structure in a model plane. 3,696,558, Cl. 46-243.0av.
Mabuchi Motor Co., Ltd.: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,696,558.
MacDonald, Robert N.: *See—*
Deschenes, Raymond J.; and MacDonald, Robert N., 3,697,693.
Mace, Nute. Flying toy. 3,696,822, Cl. 46-77.000.
Macek, Warren M.; and Wang, Chao Chen, to Sperry Rand Corporation. Ring laser having amplitude and phase controlled crossed-beam anti-locking feedback. 3,697,181, Cl. 356-106.0lr.
Machenschalk, Rudolf; and Wagner, Herbert, to Schwarzkopf Development Corporation. Rotating X-ray target. 3,697,798, Cl. 313-330.000.
Ma..hlett Laboratories, Incorporated, The: *See—*
Braun, Martin; Grossel, Stanley S.; and Singer, Barry M., 3,697,795.
Macintyre, Steven A.: *See—*
Greenberg, Myron M.; Macintyre, Steven A.; and United States of America, Navy, 3,697,869.
Mackal, Henry H.; and Behnke, Kenneth P., to Halkey-Roberts Corporation. Valve extractor. 3,696,494, Cl. 29-213.000.
Mackie, William L., to United States of America, Navy. Intumescent fillers for paints. 3,697,422, Cl. 252-8.100.
Maclin, Ernest, to Electro-Nucleonics. Mechanism for simultaneously metering and dispensing liquids. 3,696,971, Cl. 222-183.000.
MacMullan, Samuel J., to Leeds & Northrup Company. Single element adjustment for span and gain. 3,697,871, Cl. 324-99.00r.
MacMurray, Robert R. Plant growth regulation. 3,697,253, Cl. 71-97.
Macy, James R., to American Data Systems, Inc. Character correcting coding system and method for deriving the same. 3,697,947, Cl. 340-146.1aq.
Maddox, Lodric L., to Clorox Company, The. Bleaching and washing composition and process. 3,697,217, Cl. 8-111.000.
Madigan, Edward J., to Cosmetics & Pharmaceuticals, Inc. Method of protecting the skin from ultraviolet radiation with titanic acid and esters of titanic acid. 3,697,642, Cl. 424-59.000.
Magoon, Eugene F., to Shell Oil Company. Olefin-alkyl iodide exchange. 3,697,611, Cl. 260-677.0xa.
Mair, Winfried: *See—*
Sarten, Paula; and Mair, Winfried, 3,697,339.
Maksymiak, John; Beach, Kenneth M., Jr.; and Smith, James W., to Xerox Corporation. Electrostatic recording apparatus and method. 3,697,169, Cl. 355-14.000.
Malchenko, Thomas Vasilievich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily

Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Malcolm, Ronald D.; Phelan, William J.; and Sangiolo, Thomas L., to Honeywell Inc. Central processor unit having simulative interpretation capability. 3,698,007, Cl. 444-1.000.

Mallory, P. R., & Co., Inc.: *See—*
Greskamp, John B., 3,697,824.
Potter, Bronson M., 3,697,983.

Mammino, Joseph, to Xerox Corporation. Method of cleaning residual liquid developer from electrophotographic plates. 3,697,263, Cl. 96-1.400.

Maniero, Daniel A.; and Wolf, Charles B., to Westinghouse Electric Corporation. Production of acetylene with an arc heater. 3,697,612, Cl. 260-679.00r.

Mann, Abe: *See—*
Hunter, James R.; Dinerman, Bernard B.; Mann, Abe; and Schroeder, Franklin T., 3,696,946.

Mannesmann Aktiengesellschaft: *See—*
Von Hollen, Dieter; and Holder, Heinz, 3,697,718.

Marcel Mingard: *See—*
Dubois, Gerald, 3,696,609.

Marco, Gino J., to Monsanto Company. Amine containing animal feed compositions. 3,697,659, Cl. 424-325.000.

Marconi Company Limited, The: *See—*
Fenton, Roger Wakfield, 3,697,976.

Margerum, Edwin O.: *See—*
Rowland-Hill, Edward W.; and Margerum, Edwin O., 3,696,815.

Margot, Alfred: *See—*
Paltauf, Fritz; Margot, Alfred; and Brenneisen, Paul, 3,697,555.

Marietta-Martin Corporation: *See—*
Larson, Clarence E.; and Schneider, Harold G., 3,697,117.

Markart, Ernst, to Sud-Atlas-Werke G.m.b.H. Magnetic tape recorder particularly of the tape cassette type. 3,696,775, Cl. 116-67.00a.

Markevitch, Bob V.: *See—*
Van Heeckeren, Jacob; Rodal, David R.; and Markevitch, Bob V., 3,697,149.

Markley, Roger A.: *See—*
Cory, Terry S.; and Markley, Roger A., 3,697,999.

Marlin Firearms Co., The: *See—*
Morris, Stephen J.; and O'Keefe, James M., 3,697,715.

Marriott Corporation: *See—*
Mellon, Eugene P.; and Kisner, Lester A., 3,696,848.

Marshall, Connie T.: *See—*
Fort, Larry W.; and Marshall, Connie T., 3,697,884.

Marshall, John M.: *See—*
Steele, Clarence R.; Price, Frank B.; and Marshall, John M., 3,697,324.

Martin, Helmut, to Kabel- und Mettallwerke Gutehoffnungshutte Aktiengesellschaft. Method for guiding vehicles automatically along a predetermined path. 3,696,882, Cl. 180-98.000.

Martin, Joan Hixon: *See—*
Bonilla, Charles F., 3,697,234.

Martin, John: *See—*
Parker, William L.; Johnson, Francis; and Martin, John, 3,697,542.

Martin, Melvin M.: *See—*
Knight, Rodney W.; Martin, Melvin M.; and Martin, William R., 3,697,374.

Martin, Otis M.: *See—*
Kough, John K.; Martin, Otis M.; and Miller, Silas N., 3,696,570.

Martin, Paul W., to Republic Industries, Inc. Combined door checking and door hold open mechanism. 3,696,462, Cl. 16-49.0ho.

Martin, Robert L.: *See—*
Heinrich, Theodore M.; Martin, Robert L.; and Steele, David J., 3,697,850.

Martin, William R.: *See—*
Knight, Rodney W.; Martin, Melvin M.; and Martin, William R., 3,697,374.

Martinez, Jorge Sueiras. Panel assembly for furniture construction. 3,697,363, Cl. 161-44.000.

Marting, Paul G., to Wagner Electric Corporation. Control valve and system. 3,697,138, Cl. 303-6.00c.

Martone, Ronald J.; and Mueller, Peter G., to Picker Corporation. Scintillation camera having a variable gain plural amplifier system. 3,697,753, Cl. 250-71.50s.

Maruta, Hisao: *See—*
Hori, Shojiro; and Maruta, Hisao, 3,697,240.

Maruyama, Eiichi: *See—*
Asai, Shojiro; Hirao, Motohisa; and Maruyama, Eiichi, 3,697,338.

Maruyama, Isamu: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.

Marx, Thomas O., to Atwood Vacuum Machine Company. Latch for vehicle doors. 3,697,105, Cl. 292-216.000.

Maryanchik, Grigory Efimovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Masayoshi, Kuroda: *See—*
Watanabe, Tetsuo; Oikawa, Akira; and Masayoshi, Kuroda, 3,696,854.

Mascherpa, Sergio: *See—*
Rovati, Luigi; Mascherpa, Sergio; and Casula, Pierluigi, 3,697,652.

Maschinenfabrik Alfred Schmermund: *See—*
Schmermund, Alfred; and Scholz, Rudolf O., 3,696,910.

Mason, Paul J.: *See—*
Wells, Rodney L.; Ulmer, Harry E.; and Mason, Paul J., 3,697,249.

Mast, Robert E., to Hewlett-Packard Company. Regulating converter circuit. 3,697,851, Cl. 321-2.000.

Mastercraft Furniture Corporation: *See—*
Van Surksum, Edwin J., 3,697,132.

Masuda, Tetuzo; Kurosawa, Kenjiro; Hashimoto, Takeo; and Izumi, Takahisa, to Nissan Motor Company, Limited. Air cooling system of automotive engine. 3,696,730, Cl. 98-2.060.

Matas, Carlos, to Etablissements Pain-Bourgeas. Reciprocal drive mechanism. 3,696,682, Cl. 74-57.000.

Mateja, Eugene V., to Bell & Howell Company. Sound-on-film recording system. 3,697,158, Cl. 352-17.000.

Matejka, Edgar, to Bodenseewerk Geratetechnik GmbH. Plural channel system wherein the input signals are unaltered if within standard limits, but are averaged, if outside limits. 3,697,776, Cl. 307-219.000.

Mathewson, William G.: *See—*
Kisker, Laurence J.; and Mathewson, William G., 3,697,657.

Mathus, Gregory: *See—*
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 3,697,014.

Matouka, Michael F., to General Motors Corporation. Two-state zero-crossing detector. 3,697,782, Cl. 307-235.000.

Matsu, Noboru: *See—*
Hirschfeld, Tomas; and Matsu, Noboru, 3,697,226.

Matsubara, Tamotsu: *See—*
Imai, Takeshi; Matsubara, Tamotsu; and Takenaka, Osamu, 3,697,913.

Matsumura, Haruki: *See—*
Imai, Yoshio; Matsumura, Haruki; Yurugi, Shojiro; and Miyake, Akio, 3,697,530.

Matsuo, Takehiko: *See—*
Ihara, Takashi; Matsuo, Takehiko; and Ohhara, Katsunobu, 3,697,302.

Matsuoka, Toshiro; Takeda, Keinosuke; Goto, Minoru; and Miyake, Akira, to Takeda Chemical Industries, Ltd. Fd containing enduracidin. 3,697,647, Cl. 424-118.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Mohri, Etsuzo; Hayakawa, Toshio; and Nishikawa, Akira, 3,697,904.
Sasaki, Toshiharu; Miyano, Ryuzo; and Onishi, Masaru, 3,697,173.

Matsushita Kenko Kabushiki Kaisha: *See—*
Yamanouchi, Akira; Takenaka, Seisuke; and Mitori, Yukio, 3,697,350.

Matt, Richard J.: *See—*
Van Dorn, Horace B.; Matt, Richard J.; and Rolland, Thomas P., 3,697,346.

Mattel, Inc.: *See—*
Bales, Joseph H.; Prodger, Brian S.; and Ruppel, Kurt, 3,696,555.
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.
Lewis, J. Stephen; Sapkus, Jurgis; and Villasana, Armando P., 3,696,553.

Maulding, Donald Roy, to American Cyanamid Company. Chemiluminescent reaction of chlorinated glycolide with hydrogen peroxide in the presence of a fluorescer. 3,697,432, Cl. 252-188.000.

Maurice, Guy; and Jullien, Yves, to Societe pour l'Equipement des Industries Chimiques Speichim. Valve on a column for exchange between fluids. 3,696,832, Cl. 137-512.100.

Mausner, Marvin L.; and Wiesenfeld, Arnold, to Witco Chemical Corporation. Stable enzyme containing liquid detergent. 3,697,451, Cl. 252-545.000.

Maxe, Sven-Erik, to Svenska Dataregister AB. Matrix with inductive elements. 3,697,954, Cl. 340-166.00r.

Maxwell, Milton, to Colgate-Palmolive Company. Container fill weight monitoring system. 3,697,754, Cl. 250-83.300.

Maycock, William E, to Fiber Industries, Inc. Polyesters having increased whiteness. 3,697,479, Cl. 260-47.00c.

Mayer, James R.: *See—*
Palauro, Dieter K.; and Mayer, James R., 3,697,113.

Mayer, Mayer, Jr.; Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., to United States of America, Agriculture. Apparatus for producing core yarn. 3,696,600, Cl. 57-5.000.

Maynard, Donald, mesne: *See—*
Plasket, Chesteen S., 3,696,556.

Maytag, John Hardy, to Coors Porcelain Company. Metal working crank and slide press mechanism. 3,696,657, Cl. 72-450.000.

Mazoch, Charles J.: *See—*
Sharki, Martin J.; and Mazoch, Charles J., 3,698,003.

Mazur, Robert G., to Westinghouse Electric Corporation. Method for determining excess carrier lifetime in semiconductor devices. 3,697,873, Cl. 324-158.00d.

Mc Ardle, John Joseph; and Rauck, Robert Louis, to RCA Corporation. High voltage hold down circuit. 3,697,800, Cl. 315-27.00r.
Mc Card, Henry W. Textile heating and cooling. 3,696,601, Cl. 57-34.0hs.
Mc Coy, Reginald F. H., to Singer Company, The, mesne. Placement of image on matrix display. 3,697,681, Cl. 178-6.800.
Mc Culler, James F., 7/20% to Lukash, Leslie, 3/20% to Shearer, George, and and 1/20% to Scalire, Joseph L. Serological test for the detection of hepatitis. 3,697,639, Cl. 424-12.000.
Mc Dougall, Julia P., to Tranly Walls and Mini Courts (Proprietary) Limited. Non-planar ball rebound wall. 3,697,068, Cl. 273-29.00a.
Mc Queen, Norman: *See—*
Ross, Howard R.; Goodrich, Lloyd D.; and Mc Queen, Norman, 3,696,753.
McAdow, Walter R., to Mobil Oil Corporation. Metallizing coating compositions. 3,697,070, Cl. 106-290.000.
McCarron, Kerwin Peter: *See—*
Knight, Sheldon; and McCarron, Kerwin Peter, 3,697,183.
McCawley, Frank X.; Wyche, Charlie; and Schlain, David, to United States of America, Interior. Electrodeposition of metallic boride coatings. 3,697,390, Cl. 204-39.000.
McConnell, Robert G., to Honeywell Inc. Electrostatic recorder. 3,696,782, Cl. 118-637.000.
McCormick, Harold E.: *See—*
Prasse, Herbert F.; and McCormick, Harold E., 3,697,091.
McCulloch Corporation: *See—*
Henry, Charles Frederick, 3,696,901.
McCune, Ellsworth J., to Eastman Kodak Company. Automatic color subject failure correction with illuminant discrimination for photographic printers. 3,697,174, Cl. 355-38.000.
McDonough, John M.; and Gray, Linsley S., Jr. Selective isomerization of 1-olefins to 2-olefins. 3,697,616, Cl. 260-683.200.
McGraw-Edison Company: *See—*
Beasley, Silas V.; and Beam, Norman, 3,696,734.
Beeley, Michael G.; and Thompson, Richard D., 3,696,523.
McIntyre, Hal Byers; and Hickey, Harvey Edward, to SW Industries, Inc. Device for determining finger hole positions in bowling balls. 3,696,514, Cl. 33-174.00f.
McKown, Ernest M. Leak sealing device. 3,696,447, Cl. 4-1.000.
McLean, Michael B., to Johnson Service Company. Frequency to voltage converter. 3,697,781, Cl. 307-235.000.
McNeil Laboratories, Inc.: *See—*
Plostnieks, Janis, 3,697,529.
McPhail, Kenneth Jack. Trinket or ring holder. 3,696,914, Cl. 206-1.00r.
McSwiggin, Joseph R., to Procter & Gamble Company, The. Vibration energy milling of ground coffee slurries. 3,697,288, Cl. 99-71.000.
Mead Johnson & Company: *See—*
Wu, Yao Hua; and Mueller, Arthur Jacob, 3,697,553.
Means, Jay C., to Nalco Chemical Company. Titration of excess chelating agent. 3,697,224, Cl. 23-230.000.
Measurex Corporation: *See—*
Boissevain, Mathew G.; and Hill, Robert C., 3,697,755.
Medical Specialties, Inc.: *See—*
Gaylord, John F., Jr., 3,696,810.
Medicor Muvek: *See—*
Satori, Gyula, 3,697,835.
Medipak Corporation Limited: *See—*
Kovalcik, John N.; and Hovis, Donald B., 3,697,223.
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, to General Electric Company. Nuclear fuel assembly with flow channel restraining means. 3,697,376, Cl. 176-78.000.
Meier, Eugene P.; Lenz, David E.; and Sternberger, Ludwig A., to United States of America, Army. Purification of antibodies. 3,697,645, Cl. 424-85.000.
Meiji Seika Kaisha, Ltd.: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.
Meinhardt, Norman A.; and Widmer, Robert, to Lubrizol Corporation, The. Additives for lubricants and fuels. 3,697,428, Cl. 252-56.00d.
Melchior, Gerard; and Sinobad, Dusan, to Compagnie Generale d'Electricite. Circuit for switching between two unidirectional voltages. 3,697,880, Cl. 328-123.000.
Mellon, Eugene P.; and Kisner, Lester A., to Marriott Corporation. Method and apparatus for removing skin from onions or like vegetables. 3,696,848, Cl. 146-83.000.
Melville Clark Associates: *See—*
Clark, Melville, Jr.; and Luce, David A., 3,697,703.
Menasse, Raphael; and Gatzi, Karl, to Geigy Chemical Corporation. N-(4-Carboxy-benzylidene) amines. 3,697,589, Cl. 260-518.00r.
Mench, John W.: *See—*
Grant, Peter M.; Fulkerson, Brazelton; and Mench, John W., 3,697,640.
Mendell, Lester W., Jr.: *See—*
Zane, Ronald S. O.; and Mendell, Lester W., Jr., 3,697,362.
Mentha, John W.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., 3,697,512.
Merck & Co., Inc.: *See—*
Engelhardt, Edward L.; and Remy, David C., 3,697,544.
Lee, Leonard S.; Uyeda, Yoshio; and Heneghan, Leo F., 3,697,322.
Merck Patent Gesellschaft mit Beschrankter Haftung: *See—*
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,697,225.
Merkle, Eberhardt, to Wilhelm Bleyle KG. Apparatus for the impaling of weft-knitted and warp-knitted goods on needles. 3,696,764, Cl. 112-25.000.
Mermelstein, Seymour, to Tyco Laboratories, Inc. Releasable buckle. 3,696,471, Cl. 24-193.000.
Merola, Anthony, to Amerola Products Corporation. Ball bat with eccentrically thickened walls. 3,697,069, Cl. 273-72.000.
Merrill, Edward W.; and Pikarsky, Jacob M., to Grace, W. R., & Co. Container closure gasket made from a novel plastisol composition. 3,696,956, Cl. 215-40.000.
Merten, Rudolf: *See—*
Zecher, Wilfried; and Merten, Rudolf, 3,697,484.
Mertz, Henry A. Question game including mechanically indexed answer apparatus. 3,696,528, Cl. 35-9.00r.
Messerschmitt Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Butter, Karl; and Wittich, Willibald, 3,697,405.
Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Sarten, Paula; and Mair, Winfried, 3,697,339.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Butter, Karl, 3,696,676.
Messinger, Werner, to Braun Aktiengesellschaft. Shearing system for dry shavers. 3,696,508, Cl. 30-43.000.
Messner, Dieter: *See—*
Busch, Walter; Kramer, Heinz; Lind, Erwin; and Messner, Dieter, 3,697,303.
Metalines, Inc.: *See—*
Armstrong, Gary E., 3,696,575.
Metallwerk Plansee: *See—*
Schedler, Wolfgang; and Bodem, Johann, 3,696,707.
Metals, Inc.: *See—*
Evans, John D., 3,696,763.
Meuleman, Johannes; and Aussant, Michel, to U.S. Philips Corporation. Radiation detector. 3,697,825, Cl. 317-234.00r.
Meyer, Carl R., to Aquaslide 'n' Dive Corporation. Cantilever stand. 3,697,067, Cl. 272-66.000.
Meyer, Gunther, to Dynamit Nobel Aktiengesellschaft. Preparation of polyvinylchoride. 3,697,493, Cl. 260-85.50h.
Meyer, Heinz F.: *See—*
Jahnke, Heinz K.; and Meyer, Heinz F., 3,697,557.
Meyer, Ivan W. Livestock gate latch. 3,697,106, Cl. 292-175.000.
Meyer, Max F., Jr.: *See—*
Joyner, Frederick B.; Cash, George O., Jr.; and Meyer, Max F., Jr., 3,697,465.
Meyers, Robert M.: *See—*
Gallagher, John P.; Meyers, Robert M.; Sorg, Earl H.; and Willitts, Clark M., 3,697,472.
Michael, Richard W.; and Staten, Hi W., Jr., to Phillips Petroleum Company. Limit control. 3,697,780, Cl. 307-235.000.
Michishita, Isakichi: *See—*
Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, 3,697,881.
Middaugh, George J., Jr.: *See—*
Charman, Walter M., Jr.; Hayes, Robert R.; Middaugh, George J., Jr.; and Wetzig, John M., III, 3,697,631.
Middlebrook, Robert D. Adjustable speed electric power means and system. 3,697,763, Cl. 290-17.000.
Mikulec, Richard A.: *See—*
Colton, Frank B.; Mikulec, Richard A.; and Nicholson, Robert T., 3,697,509.
Milam, Ronald L.: *See—*
Yoo, Jin Sun; and Milam, Ronald L., 3,697,617.
Milchem Incorporated: *See—*
Browning, William C.; and Chesser, Billy G., 3,697,498.
Mildon, James R., to Commercial Affiliates, Inc. Pick remover. 3,696,476, Cl. 28-17.000.
Miles, Gilbert De Wayne, to Colgate-Palmolive Company. Double container with mixing means. 3,696,919, Cl. 206-47.00a.
Miles Laboratories, Inc.: *See—*
Clack, Peter Joseph; Wiswell, James David; and Clemens, Anton Hubert, 3,697,730.
Lauria, Andrew Carmine; and Owens, Jeffrey Lynn, 3,697,421.
Mille, Gaston M. Method and apparatus for cooling liquids. 3,696,636, Cl. 62-399.000.
Miller, Francis G., to Bethlehem Steel Corporation. Method for recovering fine coal and coal-containing particles in a coal recovery circuit. 3,696,923, Cl. 209-12.000.
Miller, George T., to Hooker Chemical Corporation. Bonding coatings, dyes and adhesives to substrates. 3,697,306, Cl. 117-47.00a.
Miller, Orville C.: *See—*
Sauer, Louis E.; and Miller, Orville C., 3,696,480.
Miller, Robert E.: *See—*
Churchill, Donald; Cartmell, James V.; and Miller, Robert E., 3,697,297.
Schleicher, Lowell; Miller, Robert E.; and Porter, Erland C., Jr., 3,697,371.
Miller, Robert E., to Monsanto Company. Protein-triazine ruminant feed material. 3,697,284, Cl. 99-2.00r.
Miller, Robert J.: *See—*
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 3,697,014.
Miller, Silas N.: *See—*
Kough, John K.; Martin, Otis M.; and Miller, Silas N., 3,696,570.

Mills, Evan D. Container cooling device. 3,696,633, Cl. 62-294.000.
Millward, Thomas Hughes: *See—*
Smith, Henry Thomas; and Millward, Thomas Hughes, 3,696,638.
Milner, John D.: *See—*
Lundin, Andrew P.; and Milner, John D., 3,697,005.
Milov, Vladimir Nikolaevich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.
Milton, Kirby Mitchell, to Eastman Kodak Company. Fogged, direct-positive silver halide emulsions containing strong oxidizing agents. 3,697,281, Cl. 96-108.000.
Minden, Henry T.; and Donahue, John A., to Sperry Rand Corporation. Liquid epitaxy method and apparatus. 3,697,330, Cl. 148-1.500.
Mine, Keiji, to Mitsubishi Chemical Industries, Ltd. Self-adhesive and removable non-woven fabric an process for producing the same. 3,697,315, Cl. 117-122.00p.
Minister of State for Defence, the Government of the Commonwealth of Australia: *See—*
Mostyn, William D., 3,697,103.
Minnesota Mining and Manufacturing Company: *See—*
Elder, James T.; and Wright, Donald A., 3,697,996.
Jedlicka, Philip A., 3,696,715.
Rambosek, George M.; Allen, Michael George; and Van Dyke Tiers, George, 3,697,485.
Minolta Camera Co., Ltd.: *See—*
Tanaka, Harumi, 3,696,718.
Mironov, Vladimir Florovich; Fedotov, Nikolai Semenovich; and Kozlikov, Vadim Lvovich. Method of producing 1,3-bis (hydroxyaryl) tetraorganosiloxanes. 3,697,569, Cl. 260-448.20b.
Mirtensen, Hans. Set of toy blocks. 3,696,533, Cl. 35-70.000.
Missouri Research Laboratories, Inc.: *See—*
Dickman, John J., 3,696,527.
Mitacek, Bill, to Phillips Petroleum Company. Electrical cable having sheath layers bonded with adhesive. 3,697,670, Cl. 174-107.000.
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, to Hitachi, Ltd. Joesphson junction having an intermediate layer of a hard superconducting material. 3,697,826, Cl. 317-234.00r.
Mitori, Yukio: *See—*
Yamanouchi, Akira; Takenaka, Seisuke; and Mitori, Yukio, 3,697,350.
Mitsubishi Chemical Industries, Limited: *See—*
Okada, Hitoshi; Imahori, Seiichi; and Hirako, Susumu, 3,697,525.
Mitsubishi Chemical Industries, Ltd.: *See—*
Mine, Keiji, 3,697,315.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nakata, Josuke, 3,697,833.
Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See—*
Nara, Kizo; Sukekawa, Izumi; and Yamada, Yasuo, 3,696,656.
Mitsubishi Paper Mills, Ltd.: *See—*
Uchida, Koji; and Kuriu, Sadao, 3,697,304.
Mitsubishi Rayon Co., Ltd.: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Takimoto, Hisao, 3,697,637.
Miyake, Akio: *See—*
Imai, Yoshio; Matsumura, Haruki; Yurugi, Shojiro; and Miyake, Akio, 3,697,530.
Miyake, Akira: *See—*
Matsuoka, Toshiro; Takeda, Keinosuke; Goto, Minoru; and Miyake, Akira, 3,697,647.
Miyano, Ryuzo: *See—*
Sasaki, Toshiharu; Miyano, Ryuzo; and Onishi, Masaru, 3,697,173.
Miyashita, Kanji, to Kabushiki Kaisha Suwa Seikosho. Non-circular waterproof watchcase. 3,696,608, Cl. 58-90.00r.
Miyashita, Takeo: *See—*
Ohyama, Takashi; Kawashige, Akira; and Miyashita, Takeo, 3,697,991.
Mizuguchi, Mamoru: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.
Mizuguchi, Ryuzo: *See—*
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, 3,697,619.
Mizusawa, Shigeru: *See—*
Shinoda, Kiyonori; Watanabe, Tadayoshi; and Mizusawa, Shigeru, 3,697,443.
Mo Clamp Co. Ltd.: *See—*
Mojelski, William, 3,696,653.
Mo och Aktiebolag Ornskoldsvik: *See—*
Weibull, Bengt J. G.; Thorsell, Leif Urban Folke; and Lindstrom, Sven-Olof, 3,697,598.
Mobil Oil Corporation: *See—*
McAdow, Walter R., 3,697,070.
Musgrave, Albert W., 3,697,939.
Myers, Herbert, 3,697,499.
Nasser, John, 3,697,591.
Moessinger, Albert E. External weft fed loom and a shuttle therefor. 3,696,843, Cl. 139-125.000.
Mohri, Etsuzo; Hayakawa, Toshio; and Nishikawa, Akira, to Matsushita Electric Industrial Co., Ltd. UHF tuner. 3,697,904, Cl. 334-51.000.
Moisdon, R. Francois. Vacuum pumping unit. 3,697,196, Cl. 417-211.000.
Mojelski, William, to Mo Clamp Co. Ltd. Sill clamp for automobiles. 3,696,653, Cl. 72-296.000.
Mokrushin, Konstantin Dmitrievich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.
Molex Products Company: *See—*
Krafthefer, Kerry M., 3,697,926.
Moller, Tilo: *See—*
Seidel, Alex; Moller, Tilo; and Weldle, Helmut, 3,696,706.
Momose, Yutaka: *See—*
Kitano, Shin; and Momose, Yutaka, 3,696,897.
Mones, Harri; and Mones, Walter. Machine for the zigzag folding of sheets. 3,697,062, Cl. 270-30.000.
Mones, Walter: *See—*
Mones, Harri; and Mones, Walter, 3,697,062.
Monsanto Chemicals Limited: *See—*
Brown, Joseph Patrick, 3,697,656.
Long, Frank; and Ayad, Kamal Naguib, 3,697,251.
Monsanto Company: *See—*
Bach, Hartwig C.; and Hinderer, Helmuth E., 3,697,478.
Boustany, Kamel; and Coran, Aubert Yaucher, 3,697,364.
Dobinson, Frank; and Saunders, James H., 3,697,486.
Marco, Gino J., 3,697,659.
Miller, Robert E., 3,697,284.
Reisman, Abraham J.; and Wilkinson, Thomas B., III, 3,697,365.
Stoffel, Paul J.; and Beaver, David J., 3,697,252.
Tenner, Arnold J., 3,697,632.
Monsanto Research Corporation: *See—*
Parts, Leo P.; and Hardy, Edgar E., 3,696,742.
Montalvo, Edwin J. Pivoted and removable pod mounting for brakes and clutches. 3,696,900, Cl. 192-70.000.
Montecatini Edison S.p.A.: *See—*
Pasquino, Pietro; Benzoni, Luigi; Carnisio, Giuseppe; and Colombo, Luigi, 3,697,578.
Moore Dry Kiln Company of Oregon: *See—*
Murdoch, Kenneth E.; and Turner, Donald B., 3,696,948.
Moore, George A. Breading machine. 3,696,778, Cl. 118-9.000.
Moore, John R.; Noack, William L.; and Roser, Robert A., to Avery Products Corporation. Label dispensing system. 3,696,967, Cl. 221-73.000.
Moore, Lee C., Corporation: *See—*
Campbell, Erwin A., 3,696,944.
Moore-lem, Inc.: *See—*
Lunden, Sidney L., 3,696,911.
Morat, Franz, GmbH, Firma: *See—*
Gottschall, Gernot, 3,696,982.
Moratschek, Frank G. Machine for making batches of mortar. 3,697,054, Cl. 259-154.000.
More, Oskar Wilhelm, to Telefonaktiebolaget LM Ericsson. Arrangement for metallizing of parts of a body. 3,696,781, Cl. 118-425.000.
Morello, Herbert: *See—*
Lowry, Alan B.; Mathus, Gregory; Morello, Herbert; and Miller, Robert J., 3,697,014.
Moret, Michel A., to Institut de Recherche et de Diffusion Industrielle P.G.E. Wood. Method and apparatus for oral hygiene. 3,696,809, Cl. 128-66.000.
Morey, John Richard: *See—*
Bayne, John; King, Ian Robert; and Morey, John Richard, 3,697,550.
Morgan, Ira Lon; and Rhodes, John R., to Nuclear-Chicago Corporation. Probe for locating specific elements in a borehole. 3,697,752, Cl. 250-71.50r.
Mori, Hajime; and Irizuki, Mamoru, to Nihon Denshi Kabushiki Kaisha. Apparatus for automatically recording the depolarization ratios of Raman bands. 3,697,180, Cl. 356-75.000.
Mori, Kazuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, to Daiwa Boseki Kabushiki Kaisha and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Ringless spinning machine. 3,696,605, Cl. 57-58.950.
Morion, Jay. Composite offset printing plate. 3,696,745, Cl. 101-415.100.
Moriya, Tuneo: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.
Morrill, Wayne J. High starting torque eccentric winding shaded pole motor. 3,697,842, Cl. 318-221.00r.

Morris, Horton H.; Olivier, James P.; and Prescott, Paul I., to Freeport Sulphur Company. Organo-clay-polymer compositions. 3,697,474, Cl. 260m40.00r.

Morris, Horton H.; and Prescott, Paul I., to Freeport Sulphur Company. Inorganic-organo titanate polymeric film. 3,697,475, Cl. 260-41.00a.

Morris, Ross E., to United States of America, Navy. Method for salvage of sunken ships. 3,696,773, Cl. 114-54.000.

Morris, Stephen J.; and O'Keefe, James M., to Marlin Firearms Co., The. Method of, and apparatus for, burn-fitting wooden gun stocks to metal receivers. 3,697,715, Cl. 219-10.430.

Morriston, Douglas I.; and Calvi, Salvatore J., to Pitney-Bowes, Inc. Reciprocating document carriage for photocopier. 3,697,165, Cl. 355-8.000.

Morton-Norwich Products, Inc.: *See—*
Jaech, Merrell O., 3,696,968.

Morton-Norwich Products, Inc., mesne: *See—*
Winitz, Milton, 3,697,287.

Moser, Kurt; and Hochli, Beat, to Lonza Ltd. Torsional oscillator. 3,696,664, Cl. 73-99.000.

Mosher, Richard G.: *See—*
Bishop, Irving N.; Mosher, Richard G.; and Simko, Aladar O., 3,696,798.

Moss, James R.; Roe, Richard R.; Coubrough, Lawrence E.; and Buck, Robert W., to Coors Porceln Company. Ceramic electrical resistor roll for copying machine. 3,697,836, Cl. 317-262.00a.

Moss, Theron V. Mop swab and method of manufacture. 3,696,460, Cl. 15-229.00r.

Mossey, Paul W., to General Electric Company. Weighted optical temperature measurement of rotating turbomachinery. 3,696,678, Cl. 73-346.000.

Mostyn, William D., to Minister of State for Defence, the Government of the Commonwealth of Australia. Telescopic tube locking and unlocking system. 3,697,103, Cl. 287-58.0ct.

Motorola, Inc.: *See—*
Lunn, Gerald K., 3,697,685.
Nordbrock, Raymond E., 3,697,859.
Parker, Norman W.; and Schafft, Hugo W., 3,697,788.
Wilcox, Milton E., 3,697,883.

Moulding, Kenneth William, to U.S. Philips Corporation. Semiconductor integrated circuits. 3,697,784, Cl. 307-303.000.

Mrugala, Theodore A.; and Kruck, Henry, to Warner & Swasey Company, The, mesne. Loader for mounting grinding wheels. 3,696,487, Cl. 29-200.00d.

Mueller, Arthur Jacob: *See—*
Wu, Yao Hua; and Mueller, Arthur Jacob, 3,697,553.

Mueller, Floyd F., to American Hospital Supply Corporation. Control system for hospital bed. 3,697,846, Cl. 318-544.

Mueller, Gerhart Hermann: *See—*
Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, 3,697,461.

Mueller, Herbert: *See—*
Overwien, Hermann; and Mueller, Herbert, 3,697,580.

Mueller, Peter G.: *See—*
Martone, Ronald J.; and Mueller, Peter G., 3,697,753.

Muhe, Ludwig: *See—*
Zerna, Wolfgang; and Muhe, Ludwig, 3,696,573.

Mulford, Charles T., to FMC Corporation. Fruit supporting apparatus. 3,696,943, Cl. 214-1.0bc.

Munch, Hans Joachim, to Buss A.G. Process and device for the purification of a mixture of organic substances of high molecular weight. 3,697,387, Cl. 203-72.000.

Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, to Furnier- und Sperrholzwerk, J. F. Werz, Jr., K.G. Apparatus for filling molds. 3,697,208, Cl. 425-147.000.

Munson, William O.: *See—*
Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., 3,696,750.

Murai, Tsuyoshi; and Toi, Tatsuo, to Kokusai Denki Kabushiki Kaisha. Vapor growth device. 3,696,779, Cl. 118-48.000.

Murano, Jisaku. Vehicle tire pressure indicating and signalling device. 3,697,944, Cl. 340-58.000.

Murata, Kingo; and Shinohara, Katsutoshi, to Kabushiki Kaisha Koparu. Recording clock and electrical system. 3,697,770, Cl. 307-141.400.

Murata, Takao: *See—*
Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, 3,696,622.

Murdoch, Kenneth E.; and Turner, Donald B., to Moore Dry Kiln Company of Oregon. Lumber bin sorter with guide sling and tiltable bin floor. 3,696,948, Cl. 214-16.00b.

Murray, Robert H., to Bethlehem Steel Corporation. Nodule collector. 3,697,134, Cl. 299-8.000.

Musgrave, Albert W., to Mobil Oil Corporation. Corrections for seismic data obtained from expanding-spread. 3,697,939, Cl. 340-15.5td.

Musiyachenko, Alexandr Stepanovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Musselman, Frank L.: *See—*
Eichelberger, Charles D.; and Musselman, Frank L., 3,697,819.

Myers, Herbert, to Mobil Oil Corporation. Polysulfurized olefins. 3,697,499, Cl. 260-139.000.

Naarmann, Herbert; and Hartmann, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Boric acid esters of 2-vinylthioethanol. 3,697,575, Cl. 260-462.00r.

Nacci, George Raymond; and Toole, Richard Charles, to Du Pont de Nemours, E. I., and Company. Dry magnetic copying process. 3,698,005, Cl. 346-74.

Nadir, Mark T.: *See—*
Abramson, Carl N.; and Nadir, Mark T., 3,697,959.

Nagata, Jiro: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Nagata, Nobuyoshi; and Mizuguchi, Ryuzo. Coating composition of a copolymer of methyl methacrylate with the polymerizable addition reaction product of an α~β-ethylenically unsaturated acid and an epoxy compound. 3,697,619, Cl. 260-836.

Nagavarapu, Ramarao: *See—*
Reitan, Daniel K.; and Nagavarapu, Ramarao, 3,697,773.

Nagy, Andrew: *See—*
Dunham, Tom David; Yeakley, Lester Marvin; and Nagy, Andrew, 3,696,456.

Nagy, Daniel Elmer, to American Cyanamid Company. Method for manufacture of dry strength paper containing methylamine-epichlorohydrin polymer. 3,697,370, Cl. 162-164.000.

Nahon, Abraham S. Perpetual appointment reminder. 3,696,532, Cl. 35-62.000.

Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Phase detection system for at least one digital phase-modulated wave. 3,697,881, Cl. 329-104.000.

Nakajima, Akira; and Suzuki, Hiroshi, to American Cyanamid Company. Flame-proof fibers. 3,697,218, Cl. 8-115.500.

Nakamura, Nobutaka: *See—*
Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, 3,696,622.

Nakano, Hiroshi: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Light activated thyristor. 3,697,833, Cl. 317-235.00r.

Nalco Chemical Company: *See—*
Braithwaite, David G., 3,697,446.
Means, Jay C., 3,697,224.

Namikawa, Keishi: *See—*
Watanabe, Masami; Namikawa, Keishi; Yasuda, Kotaro; and Takagi, Motoyoshi, 3,697,605.

Nania, John J. Swingable guideways for propelling a rollable device. 3,697,075, Cl. 273-110.000.

Napper, Jack C. Child's liquid spill container. 3,696,965, Cl. 220-90.400.

Nara, Kizo; Sukekawa, Izumi; and Yamada, Yasuo, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Apparatus for carrying and straightening electrolytic anode plates to be installed in an electrolytic cell. 3,696,656, Cl. 72-420.000.

Narita, Kaoru: *See—*
Asakawa, Kazuo; and Narita, Kaoru, 3,697,546.

Narusawa, Shozo; and Iizuka, Noritoshi, to Yurin Tokushu Kogyo Co. Method of and device for preserving drugs for injection. 3,696,579, Cl. 53-21.00r.

Nasser, John, to Mobil Oil Corporation. Turbulent flow leaching. 3,697,591, Cl. 260-525.000.

Nast, Robert. Transparency holder. 3,696,538, Cl. 40-104.18.

National Cash Register Company, The: *See—*
Brown, George T., Jr.; and Clark, Donald B., 3,697,323.
Campbell, Hugh W., 3,697,668.
Churchill, Donald; Cartmell, James V.; and Miller, Robert E., 3,697,297.
Fogle, Mark V.; and Horger, Georg, 3,697,437.
Schleicher, Lowell; Miller, Robert E.; and Porter, Erland C., Jr., 3,697,371.

National Gypsum Company: *See—*
Harlock, George H.; and Burkard, Edward A., 3,697,366.

National Patent Development Corporation: *See—*
Shepherd, Thomas H.; and Gould, Francis E., 3,697,643.

National Research Development: *See—*
Porteous, Andrew, 3,697,382.

National Research Development Corporation: *See—*
Carroll, Ronald Frank, 3,697,116.

National Starch and Chemical Corporation, mesne: *See—*
Grunewalder, Valentine J.; and Koeble, Earl A., 3,697,618.

National Steel Corporation: *See—*
Saunders, William T., 3,696,963.

National-Standard Company: *See—*
Fenner, James M., 3,697,262.

Navrotsky, Nikolai Viktorovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov,

Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

NDM Corporation, mesne: *See—*
Szpur, Roman, 3,696,807.

Nechaev, Ivan Petrovich: *See—*
Frolov, Jury Fedorovich; Nechaev, Ivan Petrovich; Basalaev, Anany Maximovich; Bedarev, Jury Dmitrievich; and Golikov, Viktor Valerjanovich, 3,697,660.

Nedelec, Lucien: *See—*
Boucouri, Robert; Nedelec, Lucien; and Gasc, Jean-Claude, 3,697,556.
Bucourt, Robert; Nedelec, Lucien; Gasc, Jean-Claude; and Pierdet, Andre, 3,697,510.
Bucourt, Robert; and Nedelec, Lucien, 3,697,511.

Nederlandse Organisatie voor Toegepast- Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid Handel en Verkeer: *See—*
Turnhout, Jan Van, 3,696,505.

Nederveld, Terrill L., to Packaging Corporation of America. Container construction. 3,696,988, Cl. 229-23.00r.

Nelson, Stanford C. Belt traction vehicle. 3,696,878, Cl. 180-9.460.

Nembhard, Roy: *See—*
Domin, Siegfried; and Nembhard, Roy, 3,697,971.

Ness, Leif A.; and Thomas, Edmund P., to Air Products and Chemicals, Inc. Method and apparatus for producing refrigeration. 3,696,637, Cl. 62-402.000.

Nethersell, Barry Herbert, to British Domestic Appliances Limited. Washing or other machines. 3,696,903, Cl. 192-136.000.

Neubold, Kurt: *See—*
Ibing, Gunther; and Neubold, Kurt, 3,697,541.

Neuman, Charles E.; and Shank, Leland R., to Ohio Decorative Products, Inc. Open coil electric heater. 3,697,727, Cl. 219-532.

New Jersey Machine Corporation: *See—*
Von Hofe, George W., 3,697,300.

New, John D., to Harefield Rubber Company Limited, The. Speed control system for a linear induction motor. 3,697,838, Cl. 318-135.000.

Newcombe, Sean Benjamin: *See—*
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, 3,697,729.

Newman, Douglas A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Facsimile copying process. 3,697,677, Cl. 178-6.60r.

Newman, Michael; and Boocock, David, to British Railways Board. Dampened railway car truck. 3,696,757, Cl. 105-4.00r.

NGK Insulators, Ltd.: *See—*
Tokura, Tadao, 3,696,930.

Nguyen, Quang Tan: *See—*
Biet, Jean-Pierre; Nguyen, Quang Tan; Peres, Gerard; and Ripoche, Gerard, 3,697,760.

Nichols Engineering & Research Corporation: *See—*
Richmond, Charles A., 3,696,590.

Nichols, Kenneth E.: *See—*
Bryant, Gerald T.; Linhardt, Hans D.; and Nichols, Kenneth E., 3,696,975.

Nicholson, Dallas E.: *See—*
Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., 3,696,750.

Nicholson, Robert T.: *See—*
Colton, Frank B.; Mikulec, Richard A.; and Nicholson, Robert T., 3,697,509.

Niedner, Peter Klaus: *See—*
Niedner, Peter Klaus; and Diez, Gerhard H. (said Diez assor. to said), 3,696,520.

Niedner, Peter Klaus; and Diez, Gerhard H., said Diez assor. to said Niedner, Peter Klaus. Process and device for the treatment of material. 3,696,520, Cl. 34-10.000.

Nielsen, Hans Borge: *See—*
Henningsen, Erik; and Nielsen, Hans Borge, 3,696,645.

Nielson, Jay P.; and Allred, G. Allen, to Eaton Yale & Towne, Inc. Vacuum pick up head. 3,697,112, Cl. 294-65.000.

Niemiec, Gerald M.: *See—*
Davenport, Richard L.; and Niemiec, Gerald M., 3,696,977.

Nihon Denshi Kabushiki Kaisha: *See—*
Mori, Hajime; and Irizuki, Mamoru, 3,697,180.

Niida, Taro: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.

Nikolsky, Leonid Alexandrovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Nimmo, Neil Duncan. Clips. 3,697,028, Cl. 248-121.000.

Niplex International Establishment: *See—*
Hyvarinen, Kauko Juhani, 3,697,156.

Nippon Denso Company: *See—*
Imai, Takeshi; Matsubara, Tamotsu; and Takenaka, Osamu, 3,697,913.

Nippon Electric Co., Ltd.: *See—*
Hanaoka, Masafumi, 3,697,832.

Nippon Electric Company, Limited: *See—*
Kaneko, Hisashi, 3,697,874.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 3,697,662.
Hiyama, Ryu, 3,697,664.
Tachida, Hiroki, 3,696,699.

Nippon Mining Co., Ltd.: *See—*
Watanabe, Masami; Namikawa, Keishi; Yasuda, Kotaro; and Takagi, Motoyoshi, 3,697,605.

Nippon Telegraph and Telephone Public Corporation: *See—*
Koyama, Masaki; Shimada, Sadakuni; and Karikomi, Masahiro, 3,698,001.

Nisenson, Jules, to Kelvin Research Corporation. Electrostatic reproduction device. 3,697,168, Cl. 355-12.000.

Nishiguchi, Masakatsu: *See—*
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.

Nishihar Takao: *See—*
Honma, Tsutomu; Yamada, Ta.suya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Nishikawa, Akira: *See—*
Mohri, Etsuzo; Hayakawa, Toshio; and Nishikawa, Akira, 3,697,904.

Nishimura, Takehiko: *See—*
Fukuoka, Ichiro; Kimura, Shoji; Nishimura, Takehiko; and Takahashi, Satoshi, 3,697,609.

Nishino, Keigo: *See—*
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, 3,697,577.

Nishioka, Kenichi, to Imasen Electric Industrial Co., Ltd. Sequential flash type directional signal device for automobiles. 3,697,946, Cl. 340-82.000.

Nissan Motor Company, Limited: *See—*
Irie, Namio, 3,696,839.
Masuda, Tetuzo; Kurosawa, Kenjiro; Hashimoto, Takeo; and Izumi, Takahisa, 3,696,730.

Niwa, Tomizo: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.

Noack, William L.: *See—*
Moore, John R.; Noack, William L.; and Roser, Robert A., 3,696,967.

Noakes, Thomas E.; Konen, Thomas P.; Kokalari, Albert; and Duggan, Robert B., to Scovill Manufacturing Company, mesne. Thermal motors. 3,696,611, Cl. 60-23.000.

Noguchi, Yasuhiro: *See—*
Hayakawa, Yoshihide; and Noguchi, Yasuhiro, 3,697,273.

Nord, Eric T.: *See—*
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., 3,697,313.

Nordbrock, Raymond E., to Motorola, Inc. Voltage regulator circuit for a brushless alternator. 3,697,859, Cl. 322-28.000.

Nordson Corporation: *See—*
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., 3,697,313.

Norgen, Lars E.: *See—*
Faber, Kurt H. A. E.; and Norgen, Lars E., 3,697,187.

North American Philips Corporation: *See—*
Kurtz, Stewart Kendall, 3,697,762.

North American Rockwell Corporation: *See—*
Deutsch, Ralph, 3,697,661.
Etchell, Gordon, 3,696,744.
Gibson, Earl D., 3,697,689.
Klinchuch, John F., 3,697,143.
Pilipovich, Donald; and Wilson, Richard D., 3,697,394.
Roberts, Roger G.; and Algeo, Jerry A., 3,698,008.

Northern Electric Company, Limited: *See—*
Tumilty, Thomas George, 3,696,482.

Northern Fibre Produs Company: *See—*
Ambrose, Jere B., 3,696,771.

Northrop Carolina, Inc.: *See—*
Taylor, Larry H.; Porter, William D.; Anderson, William J.; and Caneer, Ralph A., 3,697,007.

Novak, David M.; and Brown, Roberty E. Fuel burning table lamp. 3,697,739, Cl. 240-17.000.

Novo Industrial Corporation-United Air Cleaner Division: *See—*
Bennett, Raymond G.; and Luedi, Mark, 3,696,591.

Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,697,448.

Nowell, John R.; and Genuit, Luther L., to Honeywell Information Systems, Inc. Pulse generator for use with a switching regulator. 3,697,853, Cl. 321-2.000.

Nozaki, Choji; Kono, Kiichi; Sakai, Toshikiko; and Kamigaito, Osami, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Centrifugal spinning device. 3,696,604, Cl. 57-58.950.

Nuclear-Chicago Corporation: *See—*
Morgan, Ira Lon; and Rhodes, John R., 3,697,752.

Nusonics, Inc., mesne: *See—*
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,697,936.

Nystrand, Ernst Daniel, to Paper Converting Machine Company, Inc. Web winder with improved transfer. 3,697,010, Cl. 242-56.00a.

Nystuen, Arne M., to Whirlpool Corporation. Induction motor structure and reversing circuit therefor. 3,697,841, Cl. 318-207.00a.

Oakes, James A., to General Motors Corporation. Geometry for a PNP silicon transistor with overlay contacts. 3,697,828, Cl. 317-235.000.

Oakes, Vincent; and Cross, David F. W., to Interstab Limited, mesne. Vinyl chloride resins stabilized with metal compound-epoxy compound-phosphite combinations. 3,697,463, Cl. 260-23.0xa.

Obeda, Edward G., to Branson Instruments, Incorporated. Ultrasonic sealing apparatus. 3,697,357, Cl. 156-510.000.

Oberg Manufacturing Co., Inc.: *See—*
Vecchi, John C., 3,696,489.

Oberst, James Francis: *See—*
Aaron, Marvin Robert; Hammett, Warren Gail; and Oberst, James Francis, 3,697,690.

Oblasti, Khimki Moskovskoi: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Occhipinti, Carl: *See—*
Konewko, Joseph E.; and Occhipinti, Carl, 3,697,929.

Ocean Protein Corporation: *See—*
Day, John J.; and Hirschman, Paul S., 3,696,788.

O'Daniel, Stephen A., to United States of America, Navy. Automatic beam steering technique for cylindrical-array radar antennas. 3,697,994, Cl. 343-16.00r.

Odhner, Oliver Randolph, to Pennwalt Corporation. Adaptor for angularly diverting visco-elastic melt flow. 3,696,840, Cl. 138-39.000.

Ogle, Pearl R., Jr., to United States of America, Atomic Energy Commission. Method of purifying uranium hexafluoride by reduction to lower uranium fluorides. 3,697,235, Cl. 23-346.000.

Oglebay Norton Company: *See—*
Charman, Walter M., Jr.; Hayes, Robert R.; Middaugh, George J., Jr.; and Wetzig, John M., III, 3,697,631.

Oguchi, Toshihiko: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Ohhara, Katsunobu: *See—*
Ihara, Takashi; Matsuo, Takehiko; and Ohhara, Katsunobu, 3,697,302.

Ohio Decorative Products, Inc.: *See—*
Neuman, Charles E.; and Shank, Leland R., 3,697,727.

Ohkita, Masao, to Alps Electric Co., Ltd. Alternate action mechanism with driving member movable out of engagement with latching channel in unlatched position. 3,697,713, Cl. 200-153.00j.

Ohta, Wasaburo; and Soga, Setsuo, to Kabushiki Kaisha Ricoh. Electrostatic photography. 3,697,172, Cl. 355-17.000.

Ohta, Wasaburo, to Kabushiki Kaisha Ricoh. Electrostatic printing method. 3,697,268, Cl. 96-1.00r.

Ohuye, Hideki: *See—*
Kato, Yoshiaki; and Ohuye, Hideki, 3,697,789.

Ohyama, Takashi; Kawashige, Akira; and Miyashita, Takeo, to Kabushikikaisha Tokyo Seizosho (Tokyo Keiki Seizosho Co., Ltd.). Secondary radar reception system. 3,697,991, Cl. 343-6.5lc.

Oikawa, Akira: *See—*
Watanabe, Tetsuo; Oikawa, Akira; and Masayoshi, Kuroda, 3,696,854.

Oisi, Saburo. Apparatus for centrifugally separating impurities from fluid suspensions. 3,696,934, Cl. 210-512.

Okada, Hitoshi; Imahori, Seiichi; and Hirako, Susumu, to Mitsubishi Chemical Industries, Limited. Fluorescent naphthalimide derivatives. 3,697,525, Cl. 260-281.000.

Okamoto, Tadashi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.

O'Keefe, James M.: *See—*
Morris, Stephen J.; and O'Keefe, James M., 3,697,715.

Okiyama, Toshiaki: *See—*
Takenaka, Haruo; Okiyama, Toshiaki; and Hiratsuka, Nobuo, 3,697,450.

Olin Corporation: *See—*
Pitts, James J.; and Scott, Peter H., 3,697,456.
Shive, Richard A., 3,697,236.

Oliver, Michael J. Grounding electrical device and box. 3,697,924, Cl. 339-14.00r.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Salto, Rinaldo; and Roano, Domenico, 3,696,906.

Olivier, James P.: *See—*
Morris, Horton H.; Olivier, James P.; and Prescott, Paul I., 3,697,474.

O'Loughlin, Francis A.; and Herb, Philip J., to Thomas & Betts Corporation. Insulating piercing electrical connector. 3,697,669, Cl. 174-84.00c.

Olsen, Leif Thorvald, to Boen Bruk. Device for the continuous production of laminated wood of the parquet type. 3,697,361, Cl. 156-558.000.

Olson, Frank Wesley, Jr.; and Roberts, Karl Hutcheson, to Colgate-Palmolive Company. Shampoo. 3,697,452, Cl. 252-545.000.

Olson, Raymond E.; and Yone, Harold R., to Barber-Colman Company. Method and means for doffing a bobbin and forming a transfer tail. 3,696,602, Cl. 57-53.000.

Olson, Ronald A., to Tektronix, Inc. Integrating circuit. 3,697,778, Cl. 307-229.000.

Olsson, Nils O.: *See—*
Fetter, John T.; and Olsson, Nils O., 3,696,681.

Olympia Werke AG: *See—*
Werner, Georg; and Kunst, Detlef, 3,696,907.

Olympus Optical Co., Ltd.: *See—*
Kamachi, Shin-Ichi, 3,697,761.

Omark Industries, Inc.: *See—*
Baranowski, Karl F.; and Barrio, Alexander, Jr., 3,696,692.

Ongley, Milne Joseph. Method of treating osteoarthritic joints with polysiloxanes. 3,697,653, Cl. 424-184.000.

Onishi, Masaru: *See—*
Sasaki, Toshiharu; Miyano, Ryuzo; and Onishi, Masaru, 3,697,173.

Ono, Hisatake; Osada, Chiakai; Watarai, Syu; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Organic photoconductive materials for electrophotography. 3,697,266, Cl. 96-1.500.

Ono, Kunio: *See—*
Kanda, Kimio; and Ono, Kunio, 3,697,866.

Ontario Research Foundation: *See—*
Sierra, Gonzalo, 3,697,222.

Ooha, Narayanlal D.: *See—*
Tomalia, Donald A.; and Ooha, Narayanlal D., 3,697,524.

Opp, Warren P.: *See—*
Frey, Donald J.; and Opp, Warren P., 3,697,229.

Ordqvst, Olof Albert, to Aktiebolaget Karlstads Merkaniska Werkstad. Apparatus for production of casting moulds. 3,697,207, Cl. 425-63.000.

Ortega, Charlotte C. Birth announcement. 3,696,540, Cl. 40-126.

Ortelli, Aurelio, to Riva Calzoni S.p.A. Distributor for hydraulic motors. 3,696,710, Cl. 91-487.000.

Orth, Edward D.; and Yerman, Alexander J., to General Electric Company. Semiconductor strain gage pressure transducer. 3,697,917, Cl. 338-2.000.

Orth, Edward D.; and Yerman, Alexander J., to General Electric Company. Silicon diaphragm pressure sensor having improved configuration of integral strain gage elements. 3,697,918, Cl. 338-3.000.

Orth, Edward D.; and Kessel, Alvan A., to General Electric Company. Semiconductor pressure transducer structure. 3,697,919, Cl. 338-42.000.

Osada, Chiakai: *See—*
Ono, Hisatake; Osada, Chiakai; Watarai, Syu; and Katsuyama, Harumi, 3,697,266.

Oshima, Takao: *See—*
Ueno, Katsumi; Oshima, Takao; and Seki, Hideo, 3,697,496.

Ostermayer, Franz: *See—*
Denss, Rolf; Clauson-Kaas, Niels; and Ostermayer, Franz, 3,697,460.

Ostrander, Robert K.: *See—*
Sklarsky, Bernard B.; and Ostrander, Robert K., 3,696,551.

Ostrem, Halvor, to Kvaerner Brug A/S. Battening system for hatch covers. 3,696,774, Cl. 114-203.

Ostrowski, Arthur E.: *See—*
Krengel, Theodore H.; Ostrowski, Arthur E.; and Raymond, Anthony J., 3,696,503.

Oswald, Robert A.: *See—*
Oswald, Robert A.; and Bull, James R. (said Bull assor. to), 3,697,698.

Oswald, Robert A.; and Bull, James R., said Bull assor. to Oswald, Robert A. Pari-mutuel off-track betting system. 3,697,698, Cl. 179-15.00a.

Otis Engineering Corporation: *See—*
Taylor, Donald F., Jr., 3,696,868.

Ott, Eugene G., to Dresser Industries, Inc. Soft formation insert bits. 3,696,876, Cl. 175-374.000.

Ott, Henry Walter: *See—*
Leifer, Noel Arthur; and Ott, Henry Walter, 3,697,016.

Oude Alink, Bernardus A.: *See—*
Redmore, Derek; and Oude Alink, Bernardus A., 3,697,221.

Oulman, Loren C. Flexing tire traction device. 3,696,852, Cl. 152-220.000.

Outboard Marine Corporation: *See—*
Dahl, Einar S., 3,696,595.

Overwien, Hermann; and Mueller, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of buten-2-ol-4 compounds. 3,697,580, Cl. 260-468.00r.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. High speed printer of multiple copies for output information. 3,698,006, Cl. 346-74.0es.

Owens, Jeffrey Lynn: *See—*
Lauria, Andrew Carmine; and Owens, Jeffrey Lynn, 3,697,421.

Owens-Corning Fiberglas Corporation: *See—*
Smith, Roy E., 3,697,008.

Owens-Illinois, Inc.: *See—*
Lauffer, Fred E., 3,697,029.

Owens-Illinois, Inc., mesne: *See—*
Amberg, Stephen W.; and Amberg, Ralph G., 3,697,369.

Oxenrider, Bryce C.: *See—*

Beyleveld, Wilhelmus M.; Oxenrider, Bryce C.; and Woolf, Cyril, 3,697,562.
Pace, John G., to Chrysler Corporation. Marine engine water cooling. 3,696,620, Cl. 60-321.000.
Packaging Corporation of America: *See—*
Nederveld, Terrill L., 3,696,988.
Paffen, Pieter Jozef Marie: *See—*
Van Wierst, Wilhelmus Lambertus; and Paffen, Pieter Jozef Marie, 3,697,119.
Paige, Peter M. Apparatus to support the electrodes and bus bar in an electrolytic cell. 3,697,404, Cl. 204-267.
Palauro, Dieter K.; and Mayer, James R., to Gardner-Denver Company. Drill rod retrieving tool. 3,697,113, Cl. 294-86.240.
Palermiti, Frank M.: *See—*
Teuscher, Leon A.; Trubisky, Michael P.; Palermiti, Frank M.; and Levine, Charles J., 3,697,265.
Pall Corporation: *See—*
Pall, David B.; and Silverwater, Bernard F., 3,696,933.
Rosenberg, David, 3,696,932.
Pall, David B.; and Silverwater, Bernard F., to Pall Corporation. Inertia filter. 3,696,933, Cl. 210-444.000.
Palmer, David R.: *See—*
Johnson, Frederick R.; and Palmer, David R., 3,697,195.
Palmer, Donald M.; Cotton, Charles C.; and Hodges, Willmer F., to United States of America, Navy. Cable fairing system. 3,696,599, Cl. 57-1.0un.
Palmer, Stanley D. Game apparatus board. 3,697,077, Cl. 273-135.00b.
Palombo, Albert M., to American Poly-Plastics Laboratories, Inc. Self-wetting foam product and method of making same. 3,697,457, Cl. 260-2.50f.
Paltauf, Fritz; Margot, Alfred; and Brenneisen, Paul, to Ciba-Geigy Corporation. Isothiocyano-diphenyl ethers, sulfides, sulfoxides and sulfones. 3,697,555, Cl. 260-397.600.
Pande, Kailash Chandra: *See—*
Lengnick, Gunther F.; and Pande, Kailash Chandra, 3,697,477.
Pang, Michael, to American Cyanamid Company. Recovering metals by extraction with a quinaldinic acid and electrowinning from the stripped chelate. 3,697,400, Cl. 204-106.000.
Panhandle Eastern Pipe Line Company: *See—*
Lancaster, Robert W., 3,696,509.
Panigati, Pier Luigi. Fluid-operated cylinder. 3,696,714, Cl. 92-170.000.
Paper Converting Machine Company, Inc.: *See—*
Craig, Grantland A., 3,696,445.
Nystrand, Ernst Daniel, 3,697,010.
Paredes, Candelario, to Forney Engineering Company. Damper with double floating side rails. 3,696,804, Cl. 126-285.00r.
Park, James Millar. Golf board game. 3,697,072, Cl. 273-87.00h.
Park, John R. Towed folding camper having a low profile. 3,697,121, Cl. 296-23.00r.
Parker, Herbert William Mansfield, to Pyrotenax Limited. Electric cables. 3,697,671, Cl. 174-115.000.
Parker, Norman W.; and Schafft, Hugo W., to Motorola, Inc. Piezoelectric resonating device. 3,697,788, Cl. 310-9.500.
Parker, William L.; Johnson, Francis; and Martin, John, to Dow Chemical Company, The. Method of producing α-carboxylated 5-membered lactones. 3,697,542, Cl. 260-326.300.
Parkison, Richard G., to American Standard Inc. Flow control device. 3,697,002, Cl. 239-535.000.
Parr, Richard H., Jr: *See—*
Atkinson, Roger F.; Parr, Richard H., Jr; and Weil, Edward A., 3,697,984.
Parrent, Ottis L. Contact lens inserter. 3,697,109, Cl. 294-1.0ca.
Parris, Peter P., to Tridair Industries. Tie-down fitting. 3,696,759, Cl. 105-369.00a.
Parsons, Marshall F. Vertical kiln system and process. 3,697,057, Cl. 263-29.000.
Parts, Leo P.; and Hardy, Edgar E., to Monsanto Research Corporation. Method of making a stencil for screen-printing using a laser beam. 3,696,742, Cl. 101-128.400.
Pascente, Joseph E., to Grigsby-Barton, Inc. Thyristor circuits for applying a voltage to a load. 3,697,774, Cl. 307-136.000.
Pasieka, John F., to Polaroid Corporation. Identification card camera system capable of producing cards having different formats. 3,696,716, Cl. 95-11.100.
Pasquino, Pietro; Benzoni, Luigi; Carnisio, Giuseppe; and Colombo, Luigi, to Montecatini Edison S.p.A. Process for preparing 3-pentene nitrile. 3,697,578, Cl. 260-465.900.
Passal, Frank, to M & T Chemicals Inc. Electroplating processes and compositions. 3,697,391, Cl. 204-43.000.
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, to Instytut Wlokien Sztucgnych i Syntetsycgnych. Process of heterogeneous mixing spinning solutions and other viscous liquids or masses and the device tereof. 3,697,051, Cl. 259-4.000.
Patelhold Patentverwertungs- & Elektro-Holding AG: *See—*
Guanella, Gustav, 3,697,875.
Paton, John Woodhouse: *See—*
Johnstone, Crichton Lockhart; and Paton, John Woodhouse, 3,697,118.
Patrick, John L. Combined air pressure and thread depth gauge for pneumatic tires. 3,696,668, Cl. 73-146.800.
Patterson, Gordon I.; and Telfer, Dugald J., to Vapor Corporation. Railroad switch heater. 3,697,746, Cl. 246-428.000.
Patton, Willard Thomas: *See—*
Richard, Norman; Jean, Robert; Huh, William; and Patton, Willard Thomas, 3,698,000.
Pauliukonis, Richard S. Control valve. 3,696,835, Cl. 137-625.600.
Pearce, Douglas Henry, to Access Equipment Limited. Scaffolding. 3,697,032, Cl. 248-188.400.
Peck, Alvin W., to Phillips Petroleum Company. Clarifying ammonium phosphate solutions using attapulgite and bentonite. 3,697,233, Cl. 23-293.00r.
Peer, Henricus Gerardus: *See—*
Van Den Ouweland, Godefridus Antonius Maria; and Peer, Henricus Gerardus, 3,697,295.
Pefferman, William C., to PPG Industries, Inc. Treatment of titanium tetrachloride dryer residue. 3,696,519, Cl. 34-9.000.
Peiffer, Howard Richard: *See—*
Jacobs, Wayne John; Fritz, Robert William; and Peiffer, Howard Richard, 3,697,389.
Pell, Lawrence W.: *See—*
Picard, Jean P.; Seals, William O.; and Pell, Lawrence W., 3,696,748.
Penniman, Allen; and Koenig, Elmer A., to Sherwood Medical Industries, Inc. Thermometer set. 3,696,916, Cl. 206-16.600.
Pennsylvania Industrial Chemical Corporation: *See—*
Dalbey, Theodore E., 3,697,599.
Pennwalt Corporation: *See—*
Haines, Paul G.; and Albert, Harry Elmer, 3,697,470.
Odhner, Oliver Randolph, 3,696,840.
Pennzoil United, Inc.: *See—*
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., 3,697,246.
Peres, Gerard: *See—*
Biet, Jean-Pierre; Nguyen, Quang Tan; Peres, Gerard; and Ripoche, Gerard, 3,697,760.
Perina, Joseph; and Hlavaty, Albert E., to American Velcro, Inc. Closure assembly with slidable closure member. 3,696,472, Cl. 24-205.000.
Perkin-Elmer Corporation, The: *See—*
Lee, Paul H.; and Skolnick, Michael L., 3,697,887.
Perkins, Leonard: *See—*
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, 3,697,729.
Perry, John E., to Horizons Research Incorporated. Scrap recovery process. 3,697,257, Cl. 75-64.000.
Persons, Perry B.: *See—*
Wells, George H.; and Persons, Perry B., 3,697,966.
Peters, Michael L.: *See—*
Pittman, Phillip D.; and Peters, Michael L., 3,696,541.
Peters, Norman J., to Dairy Equipment Company. Cheese making apparatus. 3,696,950, Cl. 214-17.00d.
Peterson, Victor S.; and Gnecco, Arthur J. Thaw sensor. 3,696,679, Cl. 73-358.000.
Petit, George S.; and Kienberger, Charles A., to United States of America, Atomic Energy Commission. Method for preparing stable actinide peroxide sols. 3,697,441, Cl. 252-301.10s.
Petro-Tex Chemical Corporation: *See—*
Arganbright, Robert P., 3,697,613.
Petrolite Corporation: *See—*
Redmore, Derek; and Oude Alink, Bernardus A., 3,697,221.
Peyer, Siegfried: *See—*
Duss, Walter, 3,697,732.
Peyroux, Marie Alexandre Jacques Louis. Device for golf training. 3,697,081, Cl. 273-199.00a.
Pfaffenberger, Erwin; and Forsterlug, Hans, to Gossen, B., & Co. GmbH. Light measuring device. 3,697,179, Cl. 356-73.000.
Pfarrwaller, Erwin, to Sulzer Brothers, Ltd. Device for coupling a weaving shaft with a reciprocating drive lifter. 3,696,842, Cl. 139-57.
Pfeiffer, Hans Walter: *See—*
Bernold, Jean P.; and Pfeiffer, Hans Walter, 3,696,577.
Pfiffner, Albert; and Schwieter, Ulrich, to Hoffmann-La Roche Inc. Epithio compounds. 3,697,543, Cl. 260-327.00e.
Pfizer Inc.: *See—*
Butler, Kenneth, 3,697,506.
Conover, Lloyd H.; and Woodward, Robert B., 3,697,552.
Robba, William A.; and Klasson, George A., 3,697,721.
Tate, Bryce E.; and Berg, Rudolph G., 3,697,453.
Phelan, William J.: *See—*
Malcolm, Ronald D.; Phelan, William J.; and Sangiolo, Thomas L., 3,698,007.
Phelps, Thomas E.; and Kraft, Ben F. Concrete form clip. 3,697,039, Cl. 249-219.000.
Philco-Ford Corporation: *See—*
Hubbard, James R., 3,696,521.
Phillips, Adrian. Fluidfoil section. 3,697,193, Cl. 416-223.
Phillips Petroleum Company: *See—*
Cardenas, Carlos G.; and Brady, Donnie G., 3,697,607.
Cines, Martin R., 3,697,487.
Hughes, William B., 3,697,615.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,697,448.
King, Frank O., 3,697,277.

Michael, Richard W.; and Staten, Hi W., Jr., 3,697,780.
Mitacek, Bill, 3,697,670.
Peck, Alvin W., 3,697,233.
Reece, Jack E.; and Fozzard, George B., 3,697,516.
Walker, Harry L., 3,697,384.

Philpott, Peter John: *See—*
Boertje, Arie Leendert; and Philpott, Peter John, 3,696,735.

Photosystems Corporation: *See—*
Lysle, Gordon; and Bonagura, Ronald, 3,696,722.

Physikalisch-Technisches Entwichlungsburolaing: *See—*
Ludin, Ludwig, 3,696,634.

Piasek, Edmund J.; and Karll, Robert E., to Standard Oil Company (Indiana). Boron derivatives of high molecular weight Mannich condensation products. 3,697,574, Cl. 260-462.00r.

Picard, Jean P.; Seals, William O.; and Pell, Lawrence W., to United States of America, Army. Means for improving burnout of consumable cartridge cases. 3,696,748, Cl. 102-38.000.

Picker Corporation: *See—*
Goldman, Samuel C.; and Albrecht, Lance M., 3,697,956.
Martone, Ronald J.; and Mueller, Peter G., 3,697,753.

Pickett, John E. P. Microscopy tissue receptacle method. 3,697,299, Cl. 117-3.000.

Pierdet, Andre: *See—*
Bucourt, Robert; Nedelec, Lucien; Gasc, Jean-Claude; and Pierdet, Andre, 3,697,510.

Pikarsky, Jacob M.: *See—*
Merrill, Edward W.; and Pikarsky, Jacob M., 3,696,956.

Pilipovich, Donald; and Wilson, Richard D., to North American Rockwell Corporation. Synthesis of oxychlorine trifluoride. 3,697,394, Cl. 204-157.10r.

Pilot Research Corporation: *See—*
Berry, Clyde A., 3,696,444.

Pioneer Electronic Corporation: *See—*
Takahashi, Yoshio, 3,697,087.

Pioneer Magnetics, Inc.: *See—*
Berger, James K., 3,697,854.

Pitney-Bowes, Inc.: *See—*
Morriston, Douglas I.; and Calvi, Salvatore J., 3,697,165.

Pittman, Phillip D.; and Peters, Michael L., to Endura Board International, Inc. Display sign. 3,696,541, Cl. 40-142.000.

Pitts, James J.; and Scott, Peter H., to Olin Corporation. Flame retardant polyurethane foam. 3,697,456, Cl. 260-2.5aj.

Pizzimenti, Roger Philip; and Satcher, James Ware, Jr. Motor vehicle all-weather forward view mirror. 3,697,157, Cl. 350-302.000.

Plasket, Chesteen S., 1/5 to Chambers, Earl L. and 1/5 to Maynard, Donald, mesne. Hoop rolling pusher. 3,696,556, Cl. 46-220.000.

Plostnieks, Janis, to McNeil Laboratories, Inc. Aralkyl penta- and hexamethylenimine and intermediates therefor. 3,697,529, Cl. 260-293.810.

Ploszajski, Janusz: *See—*
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.

Pneumatic Scale Corporation: *See—*
Sterling, Walter S., 3,696,924.

Pneumo Dynamics Corporation: *See—*
Spriggs, Frank A., 3,696,484.

Podgor, Joseph E., Inc.: *See—*
Walker, Howard R., 3,696,738.

Podgorny, Sevantyan Ivanovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Podhajny, Richard M., to Dick, A. B., Company. Novel photoconductive carbazole polymers and photoconductive elements embodying same. 3,697,264, Cl. 96-15.000.

Poe, Lloyd Richard, to Hartwell Corporation, The. Energy absorbing device. 3,696,891, Cl. 188-1.00c.

Poignant, Jean-Claude: *See—*
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 3,697,588.

Poiter, Fred S., to Da-Lite Screen Company, Inc. Swivel standard for portable projection screen. 3,696,856, Cl. 160-24.000.

Poland, James E.: *See—*
Bunker, James F.; Poland, James E.; Sayell, Emerson H.; and Schmidt, George V., 3,697,329.

Polaroid Corporation: *See—*
Pasieka, John F., 3,696,716.
Rogers, Howard G.; and Taylor, Lloyd D., 3,697,279.
Sullivan, Robert T., 3,697,175.
Timson, William J., 3,697,269.
Timson, William J., 3,697,270.
Timson, William J., 3,697,271.

Pollak, Gottfried; and Kolb, Peter, to Tehalit Kunststofoffwerk G.m.b.H., Firma. Installation channel. 3,697,667, Cl. 174-68.00c.

Pollman, Frederic W., to Sundstrand Corporation. Hydraulic servo device. 3,697,200, Cl. 418-61.000.

Polmanteer, Keith E.; Willing, David N.; and Talcott, Thomas D., to Dow Corning Corporation. Composition curable through Si-H and Si-CH=CH_2 with improved properties. 3,697,473, Cl. 260-37.0sb.

Polydesigns Limited: *See—*
Holdham, Bertram Roy, 3,696,762.

Pommerening, Owe A.; and Russell, Stanley L. Call metering for telephone exchange. 3,697,695, Cl. 179-7.0mm.

Ponsen, Catharinus M., 1/2 to Craig, Colin. Dock side cargo handling apparatus. 3,696,947, Cl. 214-14.

Pope, George F., to Diversified Manufacturing and Marketing Co., Inc. Apparatus for forming holes in and installing lines in structural members. 3,697,188, Cl. 408-230.000.

Poppe, Wassily; and Khelghatian, Habet M., to Standard Oil Company. Contact angle measurement of plastic surfaces. 3,696,665, Cl. 73-104.000.

Porret, Daniel; and Habermeier, Juergen, to Ciba-Geigy AG. Bis-(1-α-aminopropyl-hydantoinyl-3)-alkanes. 3,697,539, Cl. 260-309.500.

Porteous, Andrew, to National Research Development. Method of and apparatus for the multi-flash distillation of liquids. 3,697,382, Cl. 202-173.000.

Porter, Erland C., Jr.: *See—*
Schleicher, Lowell; Miller, Robert E.; and Porter, Erland C., Jr., 3,697,371.

Porter, William D.: *See—*
Taylor, Larry H.; Porter, William D.; Anderson, William J.; and Caneer, Ralph A., 3,697,007.

Portz, William E.; and Stump, Harry B., to True Temper Corporation. Tool handle construction. 3,697,110, Cl. 294-57.000.

Posner, Seymour J., 25% Friedman and Goodman. Supersensitive energizing circuit. 3,697,787, Cl. 209-308.000.

Post, Wiley G.: *See—*
Potts, Robert L.; and Post, Wiley G., 3,697,099.

Potter, Bronson M., to Mallory, P. R., & Co., Inc. Alerting devices, oscillators and flip flops. 3,697,983, Cl. 340-384.00e.

Potts, Robert L.; and Post, Wiley G. Trailer cushioning and stabilizing device. 3,697,099, Cl. 280-446.00b.

Poy, Guy: *See—*
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,697,568.

PPG Industries, Inc.: *See—*
Hastings, Martin R.; and Luckock, Glenn W., 3,697,298.
Pefferman, William C., 3,696,519.
Strickland, Edward T.; and Amos, Homer C., 3,697,241.

Prasse, Herbert F.; and McCormick, Harold E., to Ramsey Corporation. Piston ring facings. 3,697,091, Cl. 277-235.

Pratt, Donald P.: *See—*
Di Laura, Arnold E.; and Pratt, Donald P., 3,697,082.

Precision Fukuhara Works, Ltd.: *See—*
Kawase, Shinji; and Sumitomo, Norishige, 3,696,640.
Sumitomo, Norishige, 3,696,641.

Preen, Robert, to Dixon, T. H., & Company Limited. Machine for forming wound rolls of sheet material. 3,696,777, Cl. 118-5.000.

Prescott, Paul I.: *See—*
Morris, Horton H.; Olivier, James P.; and Prescott, Paul I., 3,697,474.
Morris, Horton H.; and Prescott, Paul I., 3,697,475.

Pressman, Gerald L.; and Kittredge, Thomas D., to Electroprint, Inc., mesne. Apparatus for aperture controlled electrostatic image color reproduction or constitution. 3,697,164, Cl. 355-4.000.

Price, Frank B.: *See—*
Steele, Clarence R.; Price, Frank B.; and Marshall, John M., 3,697,324.

Pricer, W. David: *See—*
Beausoleil, William F.; Ho, Irving T.; Jen, Teh-Sen; and Pricer, W. David, 3,697,962.

Priestley, Hill M., to Lever Brothers Company. Process and compounds. 3,697,587, Cl. 260-501.190.

Prill, Robert S., to Singer Company, The, mesne. Analog-to-digital converter. 3,697,978, Cl. 340-347.0ad.

Prins, Richard, Jr.: *See—*
Prins, Richard, Sr.; and Prins, Richard, Jr., 3,697,056.

Prins, Richard, Sr.; and Prins, Richard, Jr., to Wolverine Manufacturing Company, mesne. Poultry manure drier and sterilizer. 3,697,056, Cl. 263-8.00r.

Procter & Gamble Company, The: *See—*
McSwiggin, Joseph R., 3,697,288.

Prodger, Brian S.: *See—*
Bales, Joseph H.; Prodger, Brian S.; and Ruppel, Kurt, 3,696,555.

Protas, Arthur I., to Cartridge Television, Inc. Head-to-tape alignment apparatus and method. 3,697,676, Cl. 178-6.60p.

Pstrocki, Henry: *See—*
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.

Pugin, Andre, to Ciba-Geigy AG. Crystalline perylenetetracarboxylic acid dibenzoylhydrazide. 3,697,526, Cl. 260-281.000.

Pulley, Monroe, Jr.: *See—*
Kucera, Alfred J.; and Pulley, Monroe, Jr., 3,696,459.

Pyke, Thomas R.: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Pyke, Thomas R., 3,697,380.

Pyrotenax Limited: *See—*
Parker, Herbert William Mansfield, 3,697,671.

Quantic Industries, Inc.: *See—*
Knight, Sheldon; and McCarron, Kerwin Peter, 3,697,183.

Quest Electronics Corporation: *See—*
Stevens, Alan F.; and Bergson, Arnold A., 3,697,973.

Quinlan, William J.; and Huver, Lawrence L., to Hastings Manufacturing Company. Method of making a backing strip for a windshield wiper blade. 3,696,497, Cl. 29-407.000.

Radune, Karl F., to Textron, Inc. Method and apparatus for making an antifriction bearing retainer. 3,696,485, Cl. 29-148.40c.

Ragard, Phillip A., to Universal Instruments Corporation. Rotary positioner. 3,696,713, Cl. 92-121.000.
Rambert , Andre: *See—*
Bousquet, Gilles; and Rambert , Andre, 3,696,446.
Ramborek, George M.; Allen, Michael George; and Van Dyke Tiers, George, to Minnesota Mining and Manufacturing Company. Process for preparing polyisocyanurates and polyurethanes using organic orthoborate catalysts. 3,697,485, Cl. 260-77.5nc.
Ramins, Lothar, to Horizons Incorporated. Process for making non-silver free radical film images visible. 3,697,272, Cl. 96-27.00.
Ramsey Corporation: *See—*
Prasse, Herbert F.; and McCormick, Harold E., 3,697,091.
Randall, John M.: *See—*
Bhagat, Gopal C.; and Randall, John M., 3,697,170.
Randell, Donald R., to Geigy Chemical Corporation, mesne. Chemical compounds and compositions. 3,696,851, Cl. 252-51.5.
Rands, Steve A. Abrasive brush having bristles with fused abrasive globules. 3,696,563, Cl. 51-332.000.
Ratcliff, Edward H., Jr.: *See—*
Anderson, Charles M.; and Ratcliff, Edward H., Jr., 3,696,754.
Ratledge, Houston: *See—*
Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., 3,696,951.
Ratouis, Roger: *See—*
Boissier, Jacques R.; and Ratouis, Roger, 3,697,590.
Rattenbury, Kenneth; and Larrison, Millard S., said Rattenbury assor. to Weston Chemical Corporation. Polymercapto polyphosphonites. 3,697,627, Cl. 260-928.000.
Rauck, Robert Louis: *See—*
Mc Ardle, John Joseph; and Rauck, Robert Louis, 3,697,800.
Raymond, Anthony J.: *See—*
Krengel, Theodore H.; Ostrowski, Arthur E.; and Raymond, Anthony J., 3,696,503.
Raymond, William J.: *See—*
Geils, Alfred E.; Raymond, William J.; Roberts, Richard W.; and Shreck, Peter K., 3,697,162.
Raytheon Company: *See—*
Bryden, Joseph E.; and Chambers, Derek, 3,697,955.
Estlick, Raymond J., 3,696,684.
Seager, Ronald W., 3,697,783.
RCA Corporation: *See—*
Avins, Jack; and Craft, Jack, 3,697,885.
Christensen, Edward Walter, II; and Eu Daly, Ronald Dale, 3,697,909.
Donoghue, William James, 3,697,777.
Douglas, Edward Curtis, 3,697,178.
Feldstein, Nathan, 3,697,319.
Hildebrants, Arnis, 3,697,686.
Lamorte, Michael F., 3,697,336.
Mc Ardle, John Joseph; and Rauck, Robert Louis, 3,697,800.
Richard, Norman; Jean, Robert; Huh, William; and Patton, Willard Thomas, 3,698,000.
Stoudenheimer, Richard G.; and Dourte, Rodger P., 3,697,794.
Yongue, James McIntire, 3,697,817.
Readyhough, Peter A., to Textron Inc. Nail having a pair of outwardly diverging head elements shaped to provide packaging, driving and fastening effectiveness and package thereof. 3,696,701, Cl. 85-28.000.
Recaro Aktiengesellschaft: *See—*
Strien, Werner; and Faust, Eberhard, 3,697,128.
Recasens, Joseph, to L'Electro-Refractoire. Cluster casting apparatus for workpieces made o poured molten refractory material. 3,697,037, Cl. 249-81.000.
Reckseit, Bernard S.; and Burgess, George A., to Sweco, Inc. Hoist pans and hoist pan handling apparatus. 3,697,006, Cl. 241-171.000.
Redmore, Derek; and Oude Alink, Bernardus A., to Petrolite Corporation. Use of thionium derivatives as corrosion inhibitors. 3,697,221, Cl. 21-2.500.
Reece, Jack E.; and Fozzard, George B., to Phillips Petroleum Company. Certain thiazine-2-thione compounds and method of preparing same. 3,697,516, Cl. 260-243.00r.
Reed, Robert D., to Zink, John, Company. Burner assembly for flare stack. 3,697,231, Cl. 23-277.00c.
Reese, Frank P.; and Yancey, LeRoy D. Display device. 3,696,536, Cl. 40-35.000.
Reeves, Wilson A.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,697,316.
Rehkopf, Charles H.: *See—*
Donofrio, Robert L.; and Rehkopf, Charles H., 3,697,301.
Reichenberger, Kurt: *See—*
Johne, Hans; Schumann, Gunter; and Reichenberger, Kurt, 3,696,743.
Reicheneder, Franz; Kropp, Rudolf; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Pyridazone derivatives. 3,697,522, Cl. 260-250.00a.
Reimann, Hans, to Schering Corporation. Process for the production of antibiotic W847-A from related antibiotics. 3,697,649, Cl. 424-120.000.
Reineking, Vernon H.: *See—*
Staudhammer, Karl P.; and Reineking, Vernon H., 3,697,634.
Reinhart, Henry F.; and Dega, Robert L., to General Motors Corporation. Side seal for rotary combustion engine. 3,697,202, Cl. 418-142.000.
Reinke, George W. Foraminous printing screen. 3,696,741, Cl. 101-128.300.
Reip, Raymond G., to GPE Controls, Inc. Electromagnetic fluid control valve. 3,696,837, Cl. 137-625.330.
Reisch, Hans, to Siemens Aktiengesellschaft. Method for the establishment of conference telegraphy connections in centrally controlled telegraphy dial exchange installations. 3,697,672, Cl. 178-3.000.
Reisman, Abraham J.; and Wilkinson, Thomas B., III, to Alton Box Board Company and Monsanto Company. Rigid-when-wet boxboard. 3,697,365, Cl. 161-133.000.
Reitan, Daniel K.; and Nagavarapu, Ramarao, to Wisconsin Alumni Research Foundation. Method and apparatus for non-oscillatory removal of transients in minimum time by bang-bang control of reactance in a power system. 3,697,773, Cl. 307-93.000.
Remington Arms Company, Inc.: *See—*
Scanlon, John J., 3,696,749.
Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 3,697,588.
Remy, David C.: *See—*
Engelhardt, Edward L.; and Remy, David C., 3,697,544.
Renfroe, Harris B.: *See—*
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,585.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,592.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,697,604.
Republic Industries, Inc.: *See—*
Martin, Paul W., 3,696,462.
Reynard, Remi: *See—*
Chatard, Michel; Grolet, Pierre; and Reynard, Remi, 3,697,114.
Reynolds, Rolfe E.; and Carlile, Alfred E., to Textron Inc. Plastic fastener and method of securing same to material. 3,696,470, Cl. 24-90.000.
Rhodes, John R.: *See—*
Morgan, Ira Lon; and Rhodes, John R., 3,697,752.
Rhone-Poulenc S.A.: *See—*
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,697,568.
Sausse, Andre, 3,696,806.
Ribner, Herbert S.; and Siddon, Thomas E., to University of Toronto, The Governors of the. Method and means of measuring velocity fluctuations in unsteady flow. 3,696,673, Cl. 73-194.00b.
Richard, Eugene D. Aquarium with improved optical qualities. 3,696,789, Cl. 119-5.000.
Richard, Norman; Jean, Robert; Huh, William; and Patton, Willard Thomas, to RCA Corporation. Flexible and slidable waveguide feed system for a radiating horn antenna. 3,698,000, Cl. 343-772.000.
Richards, Dennis H. Camping trailers. 3,697,122, Cl. 296-23.00r.
Richards, Harold R., to Canadian Patents and Development Limited. Shrinkproofing and improvement in stretch characteristics of wool. 3,697,219, Cl. 8-127.600.
Richardson, Company, The: *See—*
Alsberg, Henry, 3,697,494.
Richmond, Charles A., to Nichols Engineering & Research Corporation. Gas scrubbing system. 3,696,590, Cl. 55-238.000.
Richo Co., Ltd.: *See—*
Uchida, Michio, 3,697,849.
Richter, Fred A.: *See—*
Winsler, Robert J.; and Richter, Fred A., 3,697,723.
Rickard, Donn J., to Brown International Corporation. Apparatus for filling a container with a weighed load of fragile articles. 3,696,584, Cl. 53-239.
Ricoh Co., Ltd.: *See—*
Suzuki, Shigeru, 3,697,166.
Riehle, Harald, to IWA-Rechenschieberfabrik F. Riehle KG. Foldable game playing board. 3,697,078, Cl. 273-136.00g.
Rieker, Justus, Dr., & Co.: *See—*
Hornung, Gerhard, 3,696,534.
Riess, Joseph A., to General Motors Corporation. Three-phase inverter control circuit. 3,697,843, Cl. 318-227.000.
Riester, Oskar; and Hase, Marie, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsions which are spectrally sensitized and which contain color couplers. 3,697,282, Cl. 96-139.000.
Rieter Machine Works Ltd.: *See—*
Lattion, Andre, 3,696,468.
Rigacci, Fernando. Plant for dyeing yarn continuously. 3,696,642, Cl. 68-5.00d.
Rigg, Ralph R.: *See—*
Carlin, Ralph E.; and Rigg, Ralph R., 3,696,632.
Riiner, Ulo, to AB Karlshamns Oljefabriker. Process for producing a bakery fat product with improved ability to retard the staling of bread. 3,697,294, Cl. 99-123.000.
Riley, Donald R.: *See—*
Emon, Donald E.; and Riley, Donald R., 3,697,373.
Riley, Jefferson B. Learning table. 3,696,760, Cl. 108-32.000.
Ripoche, Gerard: *See—*
Biet, Jean-Pierre; Nguyen, Quang Tan; Peres, Gerard; and Ripoche, Gerard, 3,697,760.
Ritter, Charles P. Fish bait container and wrapping device. 3,696,585, Cl. 53-390.000.
Riva Calzoni S.p.A.: *See—*
Ortelli, Aurelio, 3,696,710.
Roano, Domenico: *See—*

Salto, Rinaldo; and Roano, Domenico, 3,696,906.

Robba, William A.; and Klasson, George A., to Air Products and Chemicals, Inc. and Pfizer Inc. Pyrolytic graphite nozzles and guide tubes for welding torches. 3,697,721, Cl. 219-136.000.

Robbins, Ernest A.: *See—*
Faith, William T., Jr.; Steigerwalt, Ronald B.; and Robbins, Ernest A., 3,697,285.

Robbins, Robert; Whitty, Arthur R.; and Kachavos, Louis J., to Sanders Associates, Inc. Antenna self-test systems. 3,697,876, Cl. 325-67.000.

Roberts, Karl Hutcheson: *See—*
Olson, Frank Wesley, Jr.; and Roberts, Karl Hutcheson, 3,697,452.

Roberts, Richard W.: *See—*
Geils, Alfred E.; Raymond, William J.; Roberts, Richard W.; and Shreck, Peter K., 3,697,162.

Roberts, Roger G.; and Algeo, Jerry A., to North American Rockwell Corporation. Latchable, polarization-agile reciprocal phase. 3,698,008, Cl. 333-31.00a.

Robertson, Aura M. Portable shampoo chair. 3,697,127, Cl. 297-182.000.

Robinson, Thomas E.: *See—*
Bartholomew, Gerald E.; Kostuch, Donald J.; Robinson, Thomas E.; and Rohland, William S., 3,697,951.

Robson, George E.: *See—*
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.

Rocheleau, David O.: *See—*
Farley, Rene; and Rocheleau, David O., 3,697,663.

Rockwell Manufacturing Company: *See—*
Bosten, Donald R.; and Rusnak, Michael, 3,696,693.
Fowler, John H.; and Barnett, Robert D., 3,696,831.

Rodal, David R.: *See—*
Van Heeckeren, Jacob; Rodal, David R.; and Markevitch, Bob V., 3,697,149.

Rodgers, John J., to White Motor Corporation. Motor vehicle with air flow deflector. 3,696,732, Cl. 98-2.140.

Roe, Malcolm David: *See—*
Edwards, John David; Perkins, Leonard; Donald, John Henry; Chappell, Peter Lee; Newcombe, Sean Benjamin; and Roe, Malcolm David, 3,697,729.

Roe, Richard R.: *See—*
Moss, James R.; Roe, Richard R.; Coubrough, Lawrence E.; and Buck, Robert W., 3,697,836.

Roeder, Harold H.; and Roeder, Marcia A. Educational testing and instructional device. 3,696,526, Cl. 35-9.00e.

Roeder, Marcia A.: *See—*
Roeder, Harold H.; and Roeder, Marcia A., 3,696,526.

Rogers, Alan B.; and Sebring, Michael, to Armour and Company. Method for making a food product in portions of controlled size and shape. 3,697,283, Cl. 99-1.000.

Rogers, Howard G.; and Taylor, Lloyd D., to Polaroid Corporation. Polymer encapsulated silver halide grains and photographic materials employing same. 3,697,279, Cl. 96-77.000.

Rohland, William S.: *See—*
Bartholomew, Gerald E.; Kostuch, Donald J.; Robinson, Thomas E.; and Rohland, William S., 3,697,951.

Rohm and Haas Company: *See—*
Faith, William T., Jr.; Steigerwalt, Ronald B.; and Robbins, Ernest A., 3,697,285.

Rohr Corporation: *See—*
Ellis, Peter H., 3,696,617.

Roje, Albert Norman, to Kango Electric Hammers Limited. Electric motor armature with stress relieved, resilient commutator load connections. 3,697,792, Cl. 310-234.000.

Rolatape Corporation: *See—*
Evans, Wallace D., Jr., 3,696,510.

Rolland, Thomas P.: *See—*
Van Dorn, Horace B.; Matt, Richard J.; and Rolland, Thomas P., 3,697,346.

Rollings, Ernest J., Jr.: *See—*
Ullman, John E.; and Rollings, Ernest J., Jr., 3,696,838.

Rombrecht, Hans-Malte: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,697,471.

Ronnings, Jacob A. Apparatus for repairing damaged carpeting. 3,697,358, Cl. 156-514.000.

Rood, Alvin A.: *See—*
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., 3,697,313.

Roos, Ernst: *See—*
Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, 3,697,433.

Rosa, Juan. Antismog device for cleaning, burning, and muffling the exhaust gases and engine compartment fumes of internal combustion engines. 3,696,619, Cl. 60-297.000.

Rosemount Engineering Company Limited: *See—*
Johnston, James Stewart, 3,697,768.

Rosemount Inc.: *See—*
Geronime, Robert L., 3,697,726.

Rosenberg, David, to Pall Corporation. Disposable filter assembly. 3,696,932, Cl. 210-437.000.

Rosenblum, Julia R. Multiple unit hand luggage. 3,696,850, Cl. 150-33.000.

Roser, Robert A.: *See—*
Moore, John R.; Noack, William L.; and Roser, Robert A., 3,696,967.

Rosher, Ronald; and Simmons, Ronald L., to Hercules Incorporated. Cool burning smokeless powder composition containing nitramine ethers. 3,697,341, Cl. 149-92.000.

Ross, Howard R.; Goodrich, Lloyd D.; and Mc Queen, Norman, to Transportation Technology, Inc. Guideway and switching linear motor propelled vehicle. 3,696,753, Cl. 104-148.0lm.

Ross, Richard J.; and Tjon, Harry X., to Kaiser Aluminum & Chemical Corporation. Mold system and apparatus for producing a composite panel. 3,697,205, Cl. 425-4.000.

Rossnan, Michael. Method of preparing crab bodies for the removal of the meat therefrom. 3,696,465, Cl. 17-48.000.

Rotadraw Limited: *See—*
Mabbutt, David Robert, 3,696,529.

Rotondo, Fortunato N.; Toledo, Emil; and Lawrence, Leslie, to United States of America, Navy. Tool for U-bending of plated wire. 3,696,846, Cl. 140-102.000.

Rotta Research Laboratorium S.p.A.: *See—*
Rovati, Luigi; Mascherpa, Sergio; and Casula, Pierluigi, 3,697,652.

Roussel-UCLAF: *See—*
Boucourt, Robert; Nedelec, Lucien; and Gasc, Jean-Claude, 3,697,556.
Bucourt, Robert; Nedelec, Lucien; Gasc, Jean-Claude; and Pierdet, Andre, 3,697,510.
Bucourt, Robert; and Nedelec, Lucien, 3,697,511.

Rousselot, Felix, to Ciba-Geigy Corporation. Gas flow dispenser bag. 3,696,972, Cl. 222-189.000.

Rovati, Luigi; Mascherpa, Sergio; and Casula, Pierluigi, to Rotta Research Laboratorium S.p.A. N-Acetylglucosamine for treating degenerative afflictions of the joints. 3,697,652, Cl. 424-180.000.

Rowland-Hill, Edward W.; and Margerum, Edwin O., to Sperry Rand Corporation. Detachable side plate for a threshing and separating unit of an axial flow combine. 3,696,815, Cl. 130-27.00j.

Roydon, William Merry, to AMP Incorporated. Electrical connector. 3,697,934, Cl. 339-217.500.

Ruben, Paul L., to Eastman Kodak Company. Compact zoom lens. 3,697,155, Cl. 350-184.000.

Rubico, Jerome A.: *See—*
Batchelder, Charles F.; and Rubico, Jerome A., 3,696,455.

Ruby, Philip Randolph: *See—*
Giambalvo, Vito Albert; and Ruby, Philip Randolph, 3,697,464.

Ruggiero, Edward M.: *See—*
Ensminger, Clifford H.; and Ruggiero, Edward M., 3,698,012.

Rumanowski, Edmund J., to Tenneco Chemicals, Inc. Process for the control of pests with substituted N,N'-Bis(haloacetyl)-o-phenylene diamines. 3,697,658, Cl. 424-324.000.

Rumball, Paul G.: *See—*
Kitchener, Charles J.; and Rumball, Paul G., 3,696,942.

Runge, Richard J., to Chevron Research Company. Method of detecting geologically anomalous bodies lateral to a borehole by comparing electrical resistivity measurements made using short-range measuring means and a long-spaced electrode array. 3,697,864, Cl 324-10.000.

Ruppel, Kurt: *See—*
Bales, Joseph H.; Prodger, Brian S.; and Ruppel, Kurt, 3,696,555.

Ruppel, Reinhold. Self-propelled toy. 3,696,557, Cl. 46-243.00m.

Rushmere, John D., to Du Pont de Nemours, E. I., and Company. Production of vinyl acetate from ethylene using novel liquid catalyst compositions. 3,697,586, Cl. 260-497.00a.

Rusnak, Michael: *See—*
Bosten, Donald R.; and Rusnak, Michael, 3,696,693.

Russell, Stanley L.: *See—*
Pommerening, Owe A.; and Russell, Stanley L., 3,697,695.

Russell, William N.: *See—*
Balint, Laszlo J.; Lazarus, Stanley D.; and Russell, William N., 3,697,579.

Ryan Aeronautical Co., The: *See—*
Kafitz, Peter H., 3,697,995.

Rygiol, Henry V. Servomotor control. 3,697,847, Cl. 318-608.000.

S & C Electric Company: *See—*
Chabala, Leonard V., 3,697,712.

S&C Electric Company: *See—*
Chabala, Leonard V.; and Evans, David M., 3,696,729.

S&S Research & Development Corporation: *See—*
Stanziola, Ralph T.; and Shuster, George A., 3,697,764.

Sachs, Ersa Ernst, K.G.: *See—*
Hombrecher, Friedrich, 3,697,724.

Sacks, William: *See—*
Bhuta, Mahendra; and Sacks, William, 3,697,368.

Sadao, Ishige: *See—*
Kimura, Shiro; Sadao, Ishige; and Kobayashi, Teruo, 3,697,540.

Saenz, Eliseo: *See—*
Faustlin, James L.; and Saenz, Eliseo, 3,697,893.

Safety Company, The: *See—*
Lee, Joo Chan, 3,697,808.

Safety Signaling, Inc., mesne: *See—*
Bernstein, Karl; and Walter, E Richard, 3,697,975.

Sagami Chemical Research Center: *See—*
Fujisawa, Tamotsu; and Kojima, Takakazu, 3,697,601.

Saggers, David Thomas, to Fisons Pest Control Limited. Decafluorbenzhydrol as a selective herbicide. 3,697,254, Cl. 71-122.

Sakai, Toshikiko: *See—*

Nozaki, Choji; Kono, Kiichi; Sakai, Toshikiko; and Kamigaito, Osami, 3,696,604.

Salaun, Harold L., Jr.: *See—*
Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,603.
Mayer, Mayer, Jr.; Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,600.

Salomon, Georges P. J. Safety boot binding for skis with two-stage recocking. 3,697,094, Cl. 280-11.35t.

Salto, Rinaldo; and Roano, Domenico, to Olivetti, Ing., C., & C., S.p.A. Character selecting device for a printing mechanism. 3,696,906, Cl. 197-18.000.

Saltzberg, Burton R.: *See—*
Lawrence, Thomas R.; and Saltzberg, Burton R., 3,697,892.

Saltzer, Joseph M., Sr. Shrink film packaging method. 3,696,580, Cl. 53-27.000.

Sanders Associates, Inc.: *See—*
Godfrey, James P., 3,697,877.
Robbins, Robert; Whitty, Arthur R.; and Kachavos, Louis J., 3,697,876.

Sandoz Ltd., a/k/a Sandoz AG: *See—*
Closse, Annemarie; and Harri, Eugen, 3,697,650.
Hunziker, Fritz; and Schmutz, Jean, 3,697,523.

Sandvikens Jernverks AB: *See—*
Faber, Kurt H. A. E.; and Norgen, Lars E., 3,697,187.

Sangiolo, Thomas L.: *See—*
Malcolm, Ronald D.; Phelan, William J.; and Sangiolo, Thomas L., 3,698,007.

Santa Fe International Corporation: *See—*
Christopher, John, 3,697,720.

Santway, Robert W.: *See—*
Alwitt, Robert S.; and Santway, Robert W., 3,697,822.

Sapkus, Jurgis: *See—*
Lewis, J. Stephen; Sapkus, Jurgis; and Villasana, Armando P., 3,696,553.

Sardisco, John B.: *See—*
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., 3,697,246.

Sarkozi, Miklos; Szabo, Andras ?.; and Hite, Perry J., to Westinghouse Electric Corporation. Signal transmission system. 3,697,896, Cl. 333-12.000.

Sarno, Richard L., to Leisure Products, Inc. Boat hoists. 3,697,048, Cl. 254-148.000.

Sarten, Paula; and Mair, Winfried, to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung. Solid propellant charge for combined rocket-ram-jet engines and process for making the same. 3,697,339, Cl. 149-19.000.

Sasaki, Toshiharu; Miyano, Ryuzo; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrophotographic processor camera. 3,697,173, Cl. 355-27.000.

Saskatchewan Government Insurance Office, The: *See—*
Loos, Edwin; and Caudle, James William, 3,697,101.

Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, to Kyodo Chemical Company Limited and Sumitomo Bakelite Company Limited. Novel organo-tin compounds. 3,697,566, Cl. 260-424.700.

Sassin, Wolfgang: *See—*
Doose, Conrad; and Sassin, Wolfgang, 3,697,665.

Satcher, James Ware, Jr.: *See—*
Pizzimenti, Roger Philip; and Satcher, James Ware, Jr., 3,697,157.

Satomura, Masato: *See—*
Hayakawa, Yoshihide; and Satomura, Masato, 3,697,275.

Satori, Gyula, to Medicor Muvek. Capacitive pressure transducer. 3,697,835, Cl. 317-246.000.

Sauer, Louis E.; and Miller, Orville C., to Centenary Central, Inc. Method of and apparatus for accurately working rotary die boards to receive cutting rule. 3,696,480, Cl. 29-26.00a.

Sauerbrey, Dennis F.: *See—*
Smith, Richard L.; and Sauerbrey, Dennis F., 3,697,865.

Sauerland, Franz L., to Clevite Corporation. Equal-resonator piezoelectric ladder filters. 3,697,903, Cl. 333-72.000.

Saunders, James H.: *See—*
Dobinson, Frank; and Saunders, James H., 3,697,486.

Saunders, Walter Selden. Drag reducer for land vehicles. 3,697,120, Cl. 296-1.00s.

Saunders, William T., to National Steel Corporation. Tool-free hand-openable container. 3,696,963, Cl. 220-60.00r.

Saurenman, Donald G.; and Smith, Harold W., to Consan Pacific Incorporated. Poultry growth enhancement method and apparatus. 3,696,791, Cl. 119-21.000.

Sausse, Andre, to Rhone-Poulenc S.A. Apparatus for taking samples of liquid. 3,696,806, Cl. 128-2.00f.

Sawada, Oshio, to Aisin Seiki Kabushiki Kaisha. Basting stitch mechanism for household zigzag sewing machine. 3,696,769, Cl. 112-159.000.

Sayed, Aziz El: *See—*
Leontaritis, Lambis; Schon, Nikolaus; Hoffmann, Hans; and Sayed, Aziz El, 3,696,498.

Sayell, Emerson H.: *See—*
Bunker, James F.; Poland, James E.; Sayell, Emerson H.; and Schmidt, George V., 3,697,329.

Scalire, Joseph L.: *See—*
Mc Culler, James F., 3,697,639.

Scanlon, John J., to Remington Arms Company, Inc. Expendable case with vented base cap. 3,696,749, Cl. 102-49.7.

Scans Associates, Inc.: *See—*
Smith, Richard ?.; and Sauerbrey, Dennis F., 3,697,865.

Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Nuclear reactor installation. 3,697,372, Cl. 176-60.000.

Schade, Gerhard; and Blaschke, Franz, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of ester resins containing isocyanurate groups and imide groups. 3,697,480, Cl. 260-47.0cb.

Schaffer, David J.; and Sutton, Trevor G., to Garrett Corporation, The. Fluidic control for motor and brake. 3,696,895, Cl. 192-3.00r.

Schafft, Hugo W.: *See—*
Parker, Norman W.; and Schafft, Hugo W., 3,697,788.

Schaufelberger, Arthur H., to Sperry Rand Corporation. Multiple beam array antenna. 3,697,998, Cl. 343-754.000.

Schedler, Wolfgang; and Bodem, Johann, to Metallwerk Plansee. Cutting of deposit forming steel and cutting tools for such steels. 3,696,707, Cl. 90-11.00c.

Schenck, Carl, Maschinenfabrik GmbH: *See—*
Klinger, Friedrich, 3,696,663.

Schering Corporation: *See—*
Reimann, Hans, 3,697,649.
Sherlock, Margaret H., 3,697,533.

Schiesser AG: *See—*
Schiesser, Walter Hugo, 3,697,209.

Schiesser, Walter Hugo, to Schiesser AG. Apparatus for manufacturing reinforced tubings from plastic materials. 3,697,209, Cl. 425-109.000.

Schjeldahl, G. T., Company: *See—*
Javarey, William E., Jr.; and Adams, Richard C., 3,697,359.

Schjerven, William N., Jr., to Western Electric Company, Incorporated. Method of recovering solid particulate material from a liquid. 3,696,928, Cl. 210-75.000.

Schjlz, Jurgen, to Bosch, Robert, G.m.b.H. Circuit for measuring the power consumption of three phase loads. 3,697,872, Cl. 324-142.000.

Schlain, David: *See—*
McCawley, Frank X.; Wyche, Charlie; and Schlain, David, 3,697,390.

Schleicher, Lowell; Miller, Robert E.; and Porter, Erland C., Jr., to National Cash Register Company, The. Capsule-fiber unit manufacture. 3,697,371, Cl. 162-183.000.

Schleifer, Werner: *See—*
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.

Schlumberger Technology Corporation: *See—*
Ingram, John D., 3,697,937.
Lafleur, Clovis L., 3,696,884.

Schluter, Wolfram, to Armstrong Cork Company. Sub-ceiling for buildings. 3,696,571, Cl. 52-144.000.

Schmermund, Alfred; and Scholz, Rudolf O., to Maschinenfabrik Alfred Schmermund. Arrangement for re-orientating rod-shaped objects. 3,696,910, Cl. 198-33.0ac.

Schmidlin, Albertus E., to TPI & Company. Control device for a reciprocating machine. 3,696,709, Cl. 91-3.000.

Schmidt, George V.: *See—*
Bunker, James F.; Poland, James E.; Sayell, Emerson H.; and Schmidt, George V., 3,697,329.

Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, to Beck, Dr., & Co., GmbH. Polyester imide resin lacquers. 3,697,471, Cl. 260-33.40p.

Schmidt, Karl-Julius; and Hammann, Ingeborg, to Farbenfabriken Bayer Aktiengesellschaft. Phosphorus acid esters of 3-hydroxy-benzo-1,2,4-triazine-1-N-oxide. 3,697,518, Cl. 260-248.00s.

Schmidt, Paul. Apparatus for performing operations on hydraulic tubing. 3,696,481, Cl. 29-33.00t.

Schmidt, Robert Richard, to Zellstoffabrik Waldhof. Process of making purine base nucleoside-5' carboxylic acids. 3,697,504, Cl. 260-211.500.

Schmitt, Charles R., to United States of America, Atomic Energy Commission. Corrosion inhibition of copper-zinc alloys. 3,697,317, Cl. 117-130.00r.

Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, to Merck Patent Gesellschaft mit Beschrankter Haftung. Indicator for the detection of cobalt ions. 3,697,225, Cl. 23-253.0tp.

Schmutz, Jean: *See—*
Hunziker, Fritz; and Schmutz, Jean, 3,697,523.

Schneider, Fred J.: *See—*
Herring, Carl R.; and Schneider, Fred J., 3,696,985.

Schneider, Harold G.: *See—*
Larson, Clarence E.; and Schneider, Harold G., 3,697,117.

Schneider, Kenneth O.: *See—*
Barecki, Chester J.; and Schneider, Kenneth O., 3,697,130.

Schneider, Richard E.: *See—*
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., 3,697,313.

Schneier, Michael Lawrence, to Sybron Corporation. Stepping switch system. 3,697,769, Cl. 307-41.000.

Schnellamn, Oscar; and Stier, Henry Willy, to Carmet Company. Automatic profile grinding machine with an indexing mechanism. 3,696,561, Cl. 51-165.880.

Schnoes, Heinrich K.: *See—*
De Luca, Hector F.; Schnoes, Heinrich K.; and Holick, Michael F., 3,697,559.

Schoengold, Herbert: *See—*
Grieg, Donald D.; and Schoengold, Herbert, 3,696,885.

Schoenwitz, Frank H. W., to Honeywell Inc. System for monitoring abnormal system operation in a system having a central station and a plurality of remote stations. 3,697,953, Cl. 340-163.00r.

Scholven-Chemie Aktiengesellschaft: *See—*
Ibing, Gunther; and Neubold, Kurt, 3,697,541.

Scholz, Gunther, to Gebruder Junghans G.m.b.H. Timepiece with indication of date and day of the week. 3,696,606, Cl. 58-58.000.

Scholz, Rudolf O.: *See—*
Schmermund, Alfred; and Scholz, Rudolf O., 3,696,910.

Schon, Nikolaus: *See—*
Leontaritis, Lambis; Schon, Nikolaus; Hoffmann, Hans; and Sayed, Aziz El, 3,696,498.

Schreitz, Robert A.: *See—*
Foster, Vincent F.; and Schreitz, Robert A., 3,696,667.

Schreyer, Gerd; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormal Roessler. Process for the production of lower aliphatic mercaptans. 3,697,602, Cl. 260-609.00r.

Schroder, Johann, to U.S. Philips Corporation. Lithium containing fuel suitable for producing calorific energy by reaction with SF_6. 3,697,239, Cl. 44-3.00r.

Schroeder, Franklin T.: *See—*
Hunter, James R.; Dinerman, Bernard B.; Mann, Abe; and Schroeder, Franklin T., 3,696,946.

Schroeder, John Howell: *See—*
Shirey, James W., 3,697,930.

Schubart, Rudiger; Eholzer, Ulrich; Kempermann, Theo; and Roos, Ernst, to Farbenfabriken Bayer Aktiengesellschaft. S,S'-Carbonyl-bis-dialkyl dithiophosphate containing vulcanization accelerator. 3,697,433, Cl. 252-182.000.

Schuff, Richard William; and Harris, Edson Sheppard, Jr., to Dart Industries, Inc. Coated cup and method of manufacture. 3,696,987, Cl. 229-1.5.

Schuierer, Manfred, to Bruckner-Apparatebau Michelsladt GmbH. Device for treating long flat textile materials. 3,696,643, Cl. 68-5.00b.

Schuler, L., GmbH: *See—*
Bergmann, Ewald; and Bareis, Alfred, 3,696,983.

Schulte, Donald W., to American Store Equipment Corporation. Showcase. 3,697,147, Cl. 312-111.000.

Schultz, Pius Dale. Material collecting means. 3,697,030, Cl. 248-101.000.

Schulze, Ernst: *See—*
Hoehn, Hans; and Schulze, Ernst, 3,697,527.
Hoehn, Hans; and Schulze, Ernst, 3,697,532.

Schumann, Gunter: *See—*
Johne, Hans; Schumann, Gunter; and Reichenberger, Kurt, 3,696,743.

Schwartz Chemical Company, Incorporated: *See—*
Schwartz, George C., 3,697,220.

Schwartz, George C., to Schwartz Chemical Company, Incorporated. Bacteria growth inhibiting textiles and dry cleaning and disinfecting compositions and processes. 3,697,220, Cl. 8-142.000.

Schwarz, Eckhard C. A., to Kimberly-Clark Corporation. Low density composite polymer film. 3,697,367, Cl. 161-168.000.

Schwarzkopf Development Corporation: *See—*
Machenschalk, Rudolf; and Wagner, Herbert, 3,697,798.

Schweiker, George C.: *See—*
Chadha, Rajendra N.; Arthur, Ralph P.; and Schweiker, George C., 3,697,489.

Schwerdhofer, Hans Joachim, to Fichtel & Sachs AG. Automatically shifting multiple speed hub. 3,696,690, Cl. 74-752.00e.

Schwieter, Ulrich: *See—*
Pfiffner, Albert; and Schwieter, Ulrich, 3,697,543.

Scott, Henry H., to Dow Chemical Company, The. Crop culture with 4H-1,2,4-triazoles. 3,697,244, Cl. 71-1.000.

Scott, Peter H.: *See—*
Pitts, James J.; and Scott, Peter H., 3,697,456.

Scovill Manufacturing Company: *See—*
Brake, Cecil Clifford, 3,696,889.
Jones, Arthur Llewelyn, 3,696,473.
Weber, Robert L., 3,696,818.

Scovill Manufacturing Company, mesne: *See—*
Noakes, Thomas E.; Konen, Thomas P.; Kokalari, Albert; and Duggan, Robert B., 3,696,611.

Sea-Land Service, Inc.: *See—*
Bodenheimer, Bert A., 3,696,952.

Seafoods Automation Corporation: *See—*
Letchworth, Herman R., 3,696,466.

Seager, Ronald W., to Raytheon Company. Transistor switching circuitry for phased array antenna systems. 3,697,783, Cl. 307-300.000.

Seals, William O.: *See—*
Picard, Jean P.; Seals, William O.; and Pell, Lawrence W., 3,696,748.

Sealth Aero Marine Company: *See—*
Day, John W., Jr., 3,697,145.

Seaman, Russell L.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., 3,697,512.

Searle, G. D., & Co.: *See—*
Colton, Frank B.; Mikulec, Richard A.; and Nicholson, Robert T., 3,697,509.

Sears, Richard P.: *See—*
Chamberlain, Terrance L.; Sears, Richard P.; and Fletcher, Ivan H., Jr., 3,697,360.

Sebring, Michael: *See—*
Rogers, Alan B.; and Sebring, Michael, 3,697,283.

Secunda, Kenneth, to Federal-Mogul Corporation. Clamp for bearing assembly. 3,696,490, Cl. 29-201.000.

Seidel, Alex; Moller, Tilo; and Weldle, Helmut, to Heckler & Koch GmbH, Firma. Self-loading pistol having forwardly extending breech slide. 3,696,706, Cl. 89-196.000.

Seismic Computing Corporation: *See—*
Taner, Mehmet Turhan, 3,697,938.

Seitzer, Walter H., to Sun Oil Company of Pennsylvania. Catalytic hydrogenation process. 3,697,415, Cl. 208-143.000.

Seiz, Richard, to Heraeus, W. C., GmbH. Composite metal coin. 3,697,237, Cl. 29-191.000.

Seki, Hideo: *See—*
Ueno, Katsumi; Oshima, Takao; and Seki, Hideo, 3,697,496.

Self, William R. Ground wire monitoring system with fail-safe power disconnect. 3,697,809, Cl. 317-18.00c.

Senter, Louis; and Johnson, Robert E., to Whittaker Corporation. Safety housing. 3,696,689, Cl. 74-609.000.

Settineri, William J.: *See—*
Wessling, Ritchie A.; and Settineri, William J., 3,697,398.

Seulen, Gerhard; and Von Starck, Axel, to AEG-Elotherm GmbH. Method for casting metered quantities of liquid metals. 3,696,858, Cl. 164-49.000.

Severynse, Gerard T., to Xerox Corporation. Imaging system. 3,697,408, Cl. 204-300.000.

Seymour Manufacturing Co.: *See—*
Hobson, Willis S.; Gregory, John T.; and Klienhaus, Clarence H., 3,697,388.

Shade, Ross A.; and Terbrack, William H., to Wrather, J. D., Jr, mesne. Bidirectional waveform generator with switchable input. 3,697,891, Cl. 332-9.00t.

Shah, Indravadan S., to Chemical Construction Corporation. Apparatus for the oxidation of liquids. 3,696,929, Cl. 210-199.000.

Shalley, Henry M., to Glazo Laboratories Limited. Dextrinization of starch with X-amylase from bacillus coagulans. 3,697,378, Cl. 195-31.00r.

Shank, Leland R.: *See—*
Neuman, Charles E.; and Shank, Leland R., 3,697,727.

Shapiro, Eugene B.: *See—*
Gore, William C.; and Shapiro, Eugene B., 3,696,639.

Sharki, Martin J.; and Mazoch, Charles J., to Dresser Industries, Inc. Recorder alarm system. 3,698,003, Cl. 346-17.000.

Sharp, Donald J.: *See—*
Baldwin, Wiley M.; Fuchs, Edward O.; and Sharp, Donald J., 3,697,255.

Shatz, Malcolm H.; and Leon, Edward, to Hooker Chemical Corporation. Process for the after-treatment of phosphate-coatings. 3,697,331, Cl. 148-6.15r.

Shearer, George, and: *See—*
Mc Culler, James F., 3,697,639.

Shefler, Sydney, to United States of America, Navy. Chemiluminescent spray formulation. 3,697,434, Cl. 252-188.300.

Shell, Irving W. Locking shelf bracket support structure. 3,697,034, Cl. 248-243.000.

Shell Oil Company: *See—*
Chapman, Ronald W., 3,696,865.
Magoon, Eugene F., 3,697,611.
Skoroszewski, Wladyslaw H.; and Stones, Dennis S., 3,697,636.
Van Dijk, Jan, 3,696,862.
Van Klinken, Jakob; Kouwenhoven, Herman Wouter; and Van Weeren, Pieter Aldert, 3,697,444.
Waid, J. M., 3,696,867.

Shepard, Alvin F.: *See—*
Dannels, Bobby F.; and Shepard, Alvin F., 3,697,459.

Shepherd, Thomas H.; and Gould, Francis E., to National Patent Development Corporation. Cosmetic preparations. 3,697,643, Cl. 424-63.000.

Sherer, Ronald B.: *See—*
Straccia, William J.; Gernert, Brooke E.; and Sherer, Ronald B., 3,696,936.

Sherlock, Margaret H., to Schering Corporation. 2-(2-Methylan ilino)-nicotinic acid. 3,697,533, Cl. 260-295.50r.

Sherman, Donald W. Support assembly for garbage cans. 3,696,938, Cl. 211-78.000.

Sherman, William P.: *See—*
Thompson, Bernard C., 3,697,111.

Sherwin-Williams Company, The: *See—*
Haughney, Joseph P., 3,697,467.

Sherwood Medical Industries, Inc.: *See—*
Penniman, Allen; and Koenig, Elmer A., 3,696,916.

Shibuya, Hideo: *See—*
Yamamoto, Masayuki; Toki, Hisashi; and Shibuya, Hideo, 3,697,334.

Shimada, Sadakuni: *See—*
Koyama, Masaki; Shimada, Sadakuni; and Karikomi, Masahiro, 3,698,001.

Shimizu, Masanao: *See—*
Yamabe, Shigeru; Shimizu, Masanao; and Yamamoto, Tadatsugu, 3,697,514.

Shinada, Hirotaka: *See—*

Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, 3,697,577.
Shinetsu Chemical Company: *See—*
Ikoma, Masanobu, 3,697,469.
Shingleton, Carroll R.: *See—*
Chadha, Rajendra N.; Arthur, Ralph P.; and Schweiker, George C., 3,697,489.
Shinkawa, Hirotoshi: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.
Shinoda, Kiyonori; Watanabe, Tadayoshi; and Mizusawa, Shigeru, to Kureha Kagaku Kogy Kabushiki Kaisha. Aluminum fluoride fluorination catalyst. 3,697,443, Cl. 252-442.000.
Shinohara, Katsutoshi: *See—*
Murata, Kingo; and Shinohara, Katsutoshi, 3,697,770.
Shintain, Sotokichi: *See—*
Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, 3,697,881.
Shirey, James W., 50% to Schroeder, John Howell. Solderless coaxial connectors. 3,697,930, Cl. 339-89.00c.
Shirey, John E.: *See—*
Lewis, James M.; and Shirey, John E., 3,697,276.
Shive, Richard A., to Olin Corporation. Combination tube form bend and inflation application. 3,697,236, Cl. 29-191.000.
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, to Meiji Seika Kaisha, Ltd. Antibiotic SF-767-A and SF767-L substances, and process for producing same by culturing a certain streptomyces microsporeus. 3,697,48, Cl. 424-118.000.
Shonebarger, Francis J., to Anchor Hocking Corporation. Strengthening borosilicate glass by crowding surface layer with LiOH and/or KOH. 3,697,242, Cl. 65-30.000.
Short, Glynn David: *See—*
Andrews, Timothy Douglas; Short, Glynn David; and Thomas, Ieuan, 3,697,528.
Shreck, Peter K.: *See—*
Geils, Alfred E.; Raymond, William J.; Roberts, Richard W.; and Shreck, Peter K., 3,697,162.
Shuster, George A.: *See—*
Stanziola, Ralph T.; and Shuster, George A., 3,697,764.
Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,697,560.
Henrick, Clive A.; and Siddall, John B., 3,697,561.
Siddall, John B., to Zolcon Corporation. 2,3-Cycloethylene-3-methylpentano-5-lactone. 3,697,549, Cl. 260-343.20r.
Siddall, John B., to Zoecon Corporation. Tetraalkyl substituted unsaturated acids and esters having a terminal quaternary alkyl group useful for insect control. 3,697,565, Cl. 260-408.000.
Siddon, Thomas E.: *See—*
Ribner, Herbert S.; and Siddon, Thomas E., 3,696,673.
Sieglinger, John C.: *See—*
Buonsante, John J.; Freericks, Lambert; Haarmann, Howard J.; and Sieglinger, John C., 3,697,702.
Siegrist, Adolf Emil, to Ciba-Geigy AG. Heterocyclic compounds containing ethylene double bonds and processes for their manufacture. 3,697,513, Cl. 260-240.00r.
Siemens Aktiengesellschaft: *See—*
Eckert, Georg; and Ciriack, Gunther, 3,697,321.
Reisch, Hans, 3,697,672.
Schabert, Hans-Peter, 3,697,372.
Tschunt, Edgar, 3,697,751.
Siepmann, Walter, Jr.: *See—*
Sobota, Herbert; Siepmann, Walter Sr.; and Siepmann, Walter, Jr., 3,696,853.
Siepmann, Walter Sr.: *See—*
Sobota, Herbert; Siepmann, Walter Sr.; and Siepmann, Walter, Jr., 3,696,853.
Siepmann-Werke KG: *See—*
Sobota, Herbert; Siepmann, Walter Sr.; and Siepmann, Walter, Jr., 3,696,853.
Sierra, Gonzalo, to Ontario Research Foundation. Sterilization with glutaraldehyde. 3,697,222, Cl. 21-54.00a.
Signetics Corporation: *See—*
Kane, James F., 3,697,775.
Silver, Howard Bernard: *See—*
Byford, Derek Clark; and Silver, Howard Bernard, 3,697,427.
Silverwater, Bernard F.: *See—*
Pall, David B.; and Silverwater, Bernard F., 3,696,933.
Simko, Aladar O.: *See—*
Bishop, Irving N.; Mosher, Richard G.; and Simko, Aladar O., 3,696,798.
Simmonds, Robert C., Jr.: *See—*
Kyritsis, William T.; and Simmonds, Robert C., Jr., 3,697,204.
Simmons, Ronald L.: *See—*
Rosher, Ronald; and Simmons, Ronald L., 3,697,341.
Simms, Bernard B.; Stein, Alvin A.; and Larosa, Charles N., to United States of America, Navy. Method of soil stabilization. 3,696,621, Cl. 61-36.00r.
Simon, Edward, to Unitrade Corporation. Structure and formation of semiconductors with transverse conductivity gradients. 3,697,827, Cl. 317-235.000.
Simpson Industries, Inc.: *See—*
Sullivan, Francis G., 3,696,513.
Simpura, Petr Mikhailovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.
Sinclair, William Y., to Thomas & Betts Corporation. Method of making a memory plane with powdered keepered material. 3,696,506, Cl. 29-604.000.
Sinclair-Koppers Company: *See—*
Trimble, Robert L., 3,697,454.
Singer, Barry M.: *See—*
Braun, Martin; Grossel, Stanley S.; and Singer, Barry M., 3,697,795.
Singer Company, The: *See—*
Levy, Kenneth, 3,696,981.
Singer Company, The, mesne: *See—*
Booth, William C.; and Kyser, Leslie T., 3,697,734.
Mc Coy, Reginald F. H., 3,697,681.
Prill, Robert S., 3,697,978.
Sinobad, Dusan: *See—*
Melchior, Gerard; and Sinobad, Dusan, 3,697,880.
Sitler, Carl L.: *See—*
Feinberg, Irving; Langdon, Jack L.; and Sitler, Carl L., 3,697,318.
Sitter, Evan L., to Sitter, Spencer B. Resilient linkage for limb shaker. 3,696,597, Cl. 56-328.0ts.
Sitter, Spencer B.: *See—*
Sitter, Evan L., 3,696,597.
SKF Industrial Trading and Development Company N.V.: *See—*
Arsenius, Torsten Henry, 3,696,841.
Sklaar, Richard L. Bench. 3,697,129, Cl. 297-217.000.
Sklarsky, Bernard B.; and Ostrander, Robert K., to Uneeda Doll Co., Inc. Growing-hair doll. 3,696,551, Cl. 46-135.000.
Skodak, Clifford A. Fluid distributing apparatus. 3,697,001, Cl. 239-521.000.
Skolnick, Michael L.: *See—*
Lee, Paul H.; and Skolnick, Michael L., 3,697,887.
Skolnick, Michael L.; and Buczek, Carl J., to United Aircraft Corporation. Cryogenically cooled Faraday rotator element. 3,697,151, Cl. 350-151.000.
Skoroszewski, Wladyslaw H.; and Stones, Dennis S., to Shell Oil Company. Process and apparatus for manufacturing fibers or yarns from molecularly orientable organic polymeric films. 3,697,636, Cl. 264-147.000.
Slauta, John, to United States of America, Army. Lacing lock for hood. 3,696,474, Cl. 24-266.000.
Small World Importing Corporation: *See—*
Lerner, Charlotte F., 3,696,918.
Smirle, James M. Modular box. 3,696,960, Cl. 220-23.400.
Smith, Bart A.: *See—*
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, 3,697,376.
Smith, Edward M.: *See—*
Caldwell, John W.; and Smith, Edward M., 3,697,799.
Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Capacitively driven charge transfer devices. 3,697,786, Cl. 307-304.000.
Smith, Harold W.: *See—*
Saurenman, Donald G.; and Smith, Harold W., 3,696,791.
Smith, Henry Thomas; and Millward, Thomas Hughes, to G.K.N. Birfield Transmissions Limited. Constant velocity universal joints. 3,696,638, Cl. 64-21.000.
Smith Industries, International, Inc.: *See—*
Garrett, William R., 3,697,141.
Smith, James Lanson: *See—*
Kish, Donald Eugene; and Smith, James Lanson, 3,697,963.
Smith, James W.: *See—*
Maksymiak, John; Beach, Kenneth M., Jr.; and Smith, James W., 3,697,169.
Smith, Jean G.; and Fitch, Frederick T., to Grace, W. R., & Co. Uranium dioxide-yttrium oxide-zirconium dioxide microspheres. 3,697,435, Cl. 252-301.100.
Smith, Lucille G.: *See—*
Smith, Theodore M., 3,697,186.
Smith, Lucille G. and Smith, Theodore M.; trustees of the Smith, Theodore M., Trust: *See—*
Smith, Theodore M., 3,697,186.
Smith, Marvin F., Jr.: *See—*
Engel, Lawrence J.; and Smith, Marvin F., Jr., 3,697,429.
Smith, Percy L.; and Comstock, Lowell R., to Union Carbide Corporation. Flame-retardant polyesters and thermosetting compositions based thereon. 3,697,625, Cl. 260-869.
Smith, Raymond L., Jr.: *See—*
Weisker, Alexander; and Smith, Raymond L., Jr., 3,696,954.
Smith, Richard D.; and Furlong, Dale A., to Combustion Power Company, Inc. Air pollution-free internal combustion engine and method for operating same. 3,696,795, Cl. 123-1.00a.
Smith, Richard L.; and Sauerbrey, Dennis F., to Scans Associates, Inc. Method and apparatus for testing engines. 3,697,865, Cl. 324-16.00r.
Smith, Roy E., to Owens-Corning Fiberglas Corporation. Apparatus for packaging linear material. 3,697,008, Cl. 242-43.000.
Smith, Theodore M.: *See—*
Smith, Theodore M., 3,697,186.

Smith, Theodore M., to Smith, Lucille G. and Smith, Theodore M.; trustees of the Smith, Theodore M., Trust. Hard start tool holder. 3,697,186, Cl. 408-142.000.
Smith, Theodore M., Trust: *See—*
Smith, Theodore M., 3,697,186.
Smith, William C. Inflatable automobile interior construction. 3,696,449, Cl. 5-94.000.
Smithey, Linual D.: *See—*
Steigleder, Charles J.; Smithey, Linual D.; and Ydon, Lloyd E., 3,696,671.
Snegoski, James J.: *See—*
Thorud, Richard A.; Snegoski, James J.; and Hasenbank, Kenneth N., 3,696,593.
Snowden, Bryan T.: *See—*
Dillon, Janus J.; and Snowden, Bryan T., 3,696,464.
Sobota, Herbert; Siepmann, Walter Sr.; and Siepmann, Walter, Jr., to Siepmann-Werke KG. Protective mail mesh. 3,696,853, Cl. 152-231.000.
Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; Gascon, Jean; Bugaut, Andree; Gallien, Jacqueline; and Gaston-Breton, Hubert, 3,697,215.
Societe Anonyme dite: Roussel-UCLAF: *See—*
Boissier, Jacques R.; and Ratouis, Roger, 3,697,590.
Societe de Fabrication d'Instruments de Mesure (SFIM): *See—*
Autechaud, Denis; and Grisard, Jean-Claude, 3,697,022.
Societe des Accumulateurs Fixes et de Traction (Societe Anonyme): *See—*
Croissant, Pierre Michel Rene; Armbruster, Jean-Claude; and Chaumeau, Andree, 3,697,327.
Jammet, Jean Firmin, 3,697,326.
Societe en nom Collectif Science Union et Cie Societe Francaise de Recherche Medicale-Suresnes: *See—*
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 3,697,588.
Societe Generale de Constructions Electriques et Mecaniques: *See—*
Soffer, Jacques; and Lhommelet, Robert, 3,697,845.
Societe Industrielle Honeywell Bull: *See—*
Daproux, Jacques Roland, 3,696,993.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Chiron, Bernard; Deschamps, Andre; and Duffau, Louis, 3,697,901.
Societe Nationale des Petroles d'Aquitaine Tour Aquitaine: *See—*
Barbier, Maurice, 3,698,009.
Societe Nationale Industrielle Aerospatiale: *See—*
Baillard, Marcel, 3,696,492.
Societe pour l'Equipement des Industries Chimiques Speichim: *See—*
Maurice, Guy; and Jullien, Yves, 3,696,832.
Soffer, Jacques; and Lhommelet, Robert, to Societe Generale de Constructions Electriques et Mecaniques. Circuit for a direct current electric motor which is controlled by thyristors both while running and while being braked. 3,697,845, Cl. 318-341.
Soga, Setsuo: *See—*
Ohta, Wasaburo; and Soga, Setsuo, 3,697,172.
Solbern Corporation: *See—*
Eisenberg, Bernard C., 3,696,581.
Solli, Arne. Welding transformers. 3,697,912, Cl. 336-133.000.
Sollman, George H.; and Dixon, Samuel J., to Honeywell Inc. Two phase encoder system for three frequency modulation. 3,697,977, Cl. 340-347.0dd.
Solo Products Corporation: *See—*
Braverman, Leslie, 3,696,937.
Somerville Industries Limited: *See—*
Dewhurst, Ernest James, 3,696,990.
Sommer, G. M., Co., Inc.: *See—*
Sommer, Gordon M., 3,696,898.
Sommer, Gordon M., to Sommer, G. M., Co., Inc. Clutch-brake unit. 3,696,898, Cl. 192-18.00a.
Sonntag, Manfred: *See—*
Ganter, Wolfgang; Assmus, Friedrich; and Sonntag, Manfred, 3,697,766.
Sorg, Earl H.: *See—*
Gallagher, John P.; Meyers, Robert M.; Sorg, Earl H.; and Willitts, Clark M., 3,697,472.
Soulie, Guy; and Lozach, Gerard, to Entreprise de Recherches et D'Activities Petrolieres (ELF). Couplings for tools and safety devices used in oil-wells. 3,697,104, Cl. 287-111.000.
Southern California Gas Co.: *See—*
Teague, Walter D., Jr., 3,696,802.
Souza, Ronald: *See—*
Dunne, Owen F.; Hebert, William E.; Souza, Ronald; and Wargat, Edward, 3,696,770.
Sovcor Electronique: *See—*
Boursin, Rene A., 3,697,818.
Sparks, Fred L. Bagging and checkout counter system. 3,696,586, Cl. 53-390.000.
Spears, Harry L. Slide valve pump. 3,697,199, Cl. 417-498.000.
Spenadel, Lawrence; Hall, Homer J.; and Kirshenbaum, Isidor, to Esso Research and Engineering Company. Method for making cellular rubbery polymer. 3,697,455, Cl. 260-2.50r.
Spencer, Merrill P. Electromagnetic flowmeter apparatus. 3,696,674, Cl. 73-194.0em.
Sperry Rand Corporation: *See—*
Arthur, Richard J., 3,697,987.
Bauer, Leo, 3,696,836.
Chow, Woo F., 3,697,964.
Colby, Kenneth G., 3,697,986.
Freimuth, John H.; and Hurlburt, Joseph C., 3,696,594.
Freyheit, Paul J.; and Lustig, Claude D., 3,697,797.
Gluck, Julius; and Lara, Raul, 3,696,908.
Macek, Warren M.; and Wang, Chao Chen, 3,697,181.
Minden, Henry T.; and Donahue, John A., 3,697,330.
Rowland-Hill, Edward W.; and Margerum, Edwin O., 3,696,815.
Schaufelberger, Arthur H., 3,697,998.
Tetrick, Elton E., 3,697,711.
Sperry Rand Corporation, mesne: *See—*
Huetten, Clarence, 3,697,965.
Spies, Robert: *See—*
United States of America, National Aeronautics and Space Administration, 3,696,833.
Spoor, Herbert: *See—*
Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, 3,697,461.
Sprague Electric Company: *See—*
Alwitt, Robert S.; and Santway, Robert W., 3,697,822.
Spriggs, Frank A., to Pneumo Dynamics Corporation. Ball mill cutter. 3,696,484, Cl. 29-105.00r.
Spruyt, Harry: *See—*
Hoffman, Louis S.; and Spruyt, Harry, 3,696,940.
Squibb, E. R., & Sons, Inc.: *See—*
Chen, James Ling, 3,696,811.
Hoehn, Hans; and Schulze, Ernst, 3,697,527.
Hoehn, Hans; and Schulze, Ernst, 3,697,532.
Staco-Switch, Inc.: *See—*
Wells, Robert R., 3,697,858.
Staley, A. E., Manufacturing Company: *See—*
Sullivan, Charles I.; and Cahill, Richard H., 3,697,466.
Stamicarbon N.V.: *See—*
Kaasenbrood, Petrus J.C., 3,697,519.
Van Nassau, Petrus J. M.; Brand, Wilhelmus K.; and Kaasenbrood, Petrus J. C., 3,697,521.
Stamler, W. R., Corporation: *See—*
Anderson, Charles M.; and Ratcliff, Edward H., Jr., 3,696,754.
Standard Oil Company: *See—*
Poppe, Wassily; and Khelghatian, Habet M., 3,696,665.
Standard Oil Company (Indiana): *See—*
Piasek, Edmund J.; and Karll, Robert E., 3,697,574.
Stanford Research Institute: *See—*
Collis, Ronald T. H., 3,696,670.
Stanislaw, Lansy: *See—*
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.
Stanley, Michael R., to Xerox Corporation. Cross-mixing baffle. 3,697,050, Cl. 259-4.000.
Stanziola, Ralph T.; and Shuster, George A., to S&S Research & Development Corporation. Method and apparatus for generating electricity. 3,697,764, Cl. 290-42.000.
Starmer, Philip H., to Goodrich, B. F., Company, The. Polymers of alkoxy alkyl acrylates, alkyl acrylates and substituted norbornene. 3,697,490, Cl. 260-80.760.
Staten, Hi W., Jr.: *See—*
Michael, Richard W.; and Staten, Hi W., Jr., 3,697,780.
Staudhammer, Karl P.; and Reineking, Vernon H., to TRW Inc. Alignment and orientation of whiskers and fibers. 3,697,634, Cl. 264-109.000.
Stauffer Chemical Company: *See—*
Brokke, Mervin E., 3,697,536.
Fancher, Llewellyn W., 3,697,582.
Lauck, Robert M., 3,697,292.
Weil, Edward D., 3,697,628.
Stauffer-Wacker Silicone Corporation, mesne: *See—*
Lengnick, Gunther F.; and Pande, Kailash Chandra, 3,697,477.
Ste'An Automobiles Citroen: *See—*
Cadiou, Jean, 3,697,093.
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich. Machine for casting thin-walled large-size pieces. 3,697,038, Cl. 249-137.000.
Steele, Clarence R.; Price, Frank B.; and Marshall, John M., to CF & I Engineers, Inc. Apparatus for removing liquid from fibrous materials. 3,697,324, Cl. 127-2.
Steele, David J.: *See—*
Heinrich, Theodore M.; Martin, Robert L.; and Steele, David J., 3,697,850.
Steele, Michael F.; and Yates, John S., to Susquehanna Corporation, The. Separation system. 3,696,488, Cl. 29-200.00d.
Steele, Michael F., to Susquehanna Corporation, The. Control apparatus. 3,696,686, Cl. 74-337.500.
Stehlin, Robert A., to Texas Instruments, Incorporated. Process for fabricating a monolithic circuit with high Q capacitor. 3,697,337, Cl. 148-175.000.
Steigerwalt, Ronald B.: *See—*
Faith, William T., Jr.; Steigerwalt, Ronald B.; and Robbins, Ernest A., 3,697,285.
Steigleder, Charles J.; Smithey, Linual D.; and Ydon, Lloyd E., to Hughes Aircraft Company. Aircraft horizontal situation navigation display system. 3,696,671, Cl. 73-178.00r.

Stein, Alfred: *See—*
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,697,225.
Stein, Alvin A.: *See—*
Simms, Bernard B.; Stein, Alvin A.; and Larosa, Charles N., 3,696,621.
Steiner Company Lausanne S.A.: *See—*
Boisen, Christian K. F., 3,697,146.
Stenbacka, Johan Runar, to Atlas Copco Aktiebolag. Rotary power tool having automatic torque shift. 3,696,871, Cl. 173-12.000.
Sterlich, Heinrich. Device for automatic plant watering. 3,696,827, Cl. 137-79.000.
Sterling Drug Inc.: *See—*
Gubitz, Franklyn W., 3,697,505.
Lesher, George Y., 3,697,531.
Teletzke, Gerald H.; Knopp, Paul V.; and Erickson, Allen H., 3,697,417.
Sterling, Walter S., to Pneumatic Scale Corporation. Cap feeding apparatus. 3,696,924, Cl. 209-73.000.
Sternbach, Leo Henryk: *See—*
Field, George Francis; and Sternbach, Leo Henryk, 3,697,545.
Sternberger, Ludwig A.: *See—*
Meier, Eugene P.; Lenz, David E.; and Sternberger, Ludwig A., 3,697,645.
Stevens, Alan F.; and Bergson, Arnold A., to Quest Electronics Corporation. Sound hazard integrator. 3,697,973, Cl. 340-261.000.
Stewart, James R., Jr.: *See—*
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., 3,697,246.
Stewart, Larry C. Equation apparatus. 3,696,531, Cl. 35-31.00a.
Stewart, Sterling E.: *See—*
Lloyd, Harold B.; and Stewart, Sterling E., 3,696,996.
Stier, Henry Willy: *See—*
Schnellamn, Oscar; and Stier, Henry Willy, 3,696,561.
Stillwell-Gerard Construction Co.: *See—*
Alexander, James M., 3,696,625.
Stirzenbecher, George H., to Air Plastic Service GmbH. Heating devices. 3,697,728, Cl. 219-548.
Stoffel, Paul J.; and Beaver, David J., to Monsanto Company. Phytotoxicant. 3,697,252, Cl. 71-95.000.
Stone, Julian, to Bell Telephone Laboratories, Incorporated. Arrangements for detecting distorted optical pulses using a correlation technique. 3,697,757, Cl. 250-199.000.
Stones, Dennis S.: *See—*
Skoroszewski, Wladyslaw H.; and Stones, Dennis S., 3,697,636.
Stonier, Robert Alden: *See—*
Berenson, Herman; Stonier, Robert Alden; and Wiese, Eugene Everett, 3,697,655.
Stoudenheimer, Richard G.; and Dourte, Rodger P., to RCA Corporation. Photocathode comprising layers of tin oxide, antimony oxide, and antimony. 3,697,794, Cl. 313-94.000.
Straccia, William J.; Gernert, Brooke E.; and Sherer, Ronald B., to Electro-Space Fabricators, Inc. Printed circuit card rack. 3,696,936, Cl. 211-41.000.
Strauss, William A., Jr. Coil form. 3,697,911, Cl. 336-84.000.
Strickland, Edward T.; and Amos, Homer C., to PPG Industries, Inc. Method and apparatus for providing controlled quench in the manufacture of fiber glass. 3,697,241, Cl. 65-2.
Strien, Werner; and Faust, Eberhard, to Recaro Aktiengesellschaft. Motor vehicle seat. 3,697,128, Cl. 297-216.000.
Strilko, Peter S., to Du Pont de Nemours, E. I., and Company. Hexaarylbiimidazole-selected aromatic hydrocarbon compositions. 3,697,280, Cl. 96-90.000.
Stritzko, Vilem, to Bleiche AG. Method for treating a yarn with foam. 3,697,314, Cl. 117-120.000.
Strobel, Albert: *See—*
Gryctko, Carl E.; Strobel, Albert; and Ball, Kenneth D., 3,697,714.
Studli, Hans. Worm housing for double worm press. 3,696,736, Cl. 100-146.000.
Stump, Harry B.: *See—*
Portz, William E.; and Stump, Harry B., 3,697,110.
Stumphauzer, William C.; Hogstrom, Edwin F.; Nord, Eric T.; Schneider, Richard E.; and Rood, Alvin A., to Nordson Corporation. Method of spraying closed end cans. 3,697,313, Cl. 117-96.000.
Subsea Equipment Associates Limited: *See—*
Brown, Walter, 3,696,864.
Sud-Atlas-Werke G.m.b.H.: *See—*
Markart, Ernst, 3,696,775.
Suder, Jack K.: *See—*
Lucas, James M.; Suder, Jack K.; and Vander Wall, Eugene M., 3,696,616.
Sudo, Takao: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.
Sukekawa, Izumi: *See—*
Nara, Kizo; Sukekawa, Izumi; and Yamada, Yasuo, 3,696,656.
Sullivan, Charles I.; and Cahill, Richard H., to Staley, A. E., Manufacturing Company. Polymer composition. 3,697,466, Cl. 260-29.6.
Sullivan, Francis G., to Simpson Industries, Inc. Three-phase gauging system. 3,696,513, Cl. 33-174.000.
Sullivan, Robert T., to Polaroid Corporation. Camera attachment for copying photographic transparencies. 3,697,175, Cl. 355-39.000.
Sullivan, William A., to Xerox Corporation. Simultaneous image transfer. 3,697,171, Cl. 355-17.000.
Sulzer Brothers, Ltd.: *See—*
Pfarrwaller, Erwin, 3,696,842.
Sumi, Mitsugu: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.
Sumitomo Bakelite Company Limited: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.
Sumitomo Chemical Co., Ltd.: *See—*
Ueno, Katsumi; Oshima, Takao; and Seki, Hideo, 3,697,496.
Sumitomo Chemical Company, Limited: *See—*
Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, 3,696,622.
Sumitomo Chemical Company, Ltd.: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.
Sumitomo Durez Company, Limited: *See—*
Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, 3,696,622.
Sumitomo, Norishige: *See—*
Kawase, Shinji; and Sumitomo, Norishige, 3,696,640.
Sumitomo, Norishige, to Precision Fukuhara Works, Ltd. Needle selecting means for knitting machines. 3,696,641, Cl. 66-40.000.
Summerfelt, Vernon E., to Clorox Company, The. Liquid drain opening composition and method. 3,697,431, Cl. 252-103.000.
Sun Oil Company: *See—*
Turner, John O., 3,697,603.
Sun Oil Company (Delaware): *See—*
Bennett, John D., 3,696,624.
Sun Oil Company of Pennsylvania: *See—*
Seitzer, Walter H., 3,697,415.
Sundby, Bjorn; and Wixon, Harold Eugene, to Colgate-Palmolive Company. Wash cycle softener. 3,697,423, Cl. 252-8.800.
Sundelin, Allen O. Boat stabilizer-sailing ring. 3,696,772, Cl. 114-39.000.
Sunderman, Wallace H.: *See—*
Unger, Robert W.; and Sunderman, Wallace H., 3,696,507.
Sundstrand Corporation: *See—*
Pollman, Frederic W., 3,697,200.
Sung, Fu-Tien, to Kidde, Walter, & Company, Inc., mesne. Multi-section hydraulic ram. 3,696,712, Cl. 92-52.000.
Sur, Ferdinand F. Combined, jack, and clamp, sure, clamp. 3,697,046, Cl. 254-111.000.
Surprenant, Norman F.: *See—*
Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., 3,697,238.
Susquehanna Corporation, The: *See—*
Steele, Michael F.; and Yates, John S., 3,696,488.
Steele, Michael F., 3,696,686.
Suttkus, David J.: *See—*
Grabill, Paul J., Jr.; and Suttkus, David J., 3,696,615.
Sutton, Trevor G.: *See—*
Schaffer, David J.; and Sutton, Trevor G., 3,696,895.
Suvanto, Antti; and van Santen, Aart, to Allmanna Svenska Elecktriska Aktiebolaget. Fuel assembly for insertion from above into a nuclear reactor core. 3,697,375, Cl. 176-78.000.
Suzue, Seigo: *See—*
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, 3,697,577.
Suzuki, Hiroshi: *See—*
Nakajima, Akira; and Suzuki, Hiroshi, 3,697,218.
Suzuki, Migaku: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Takimoto, Hisao, 3,697,637.
Suzuki, Shigeru, to Ricoh Co., Ltd. Exposing device for copying apparatus. 3,697,166, Cl. 355-8.000.
Svendsen, Per Just, to LKB Produkter AB. Apparatus for electrophoretic separation. 3,697,406, Cl. 204-299.000.
Svenska Dataregister AB: *See—*
Maxe, Sven-Erik, 3,697,954.
SW Industries, Inc.: *See—*
McIntyre, Hal Byers; and Hickey, Harvey Edward, 3,696,514.
Sweco, Inc.: *See—*
Reckseit, Bernard S.; and Burgess, George A., 3,697,006.
Swedenberg, Clyde J.; and Cziesla, Manfred J., to United States of America, Navy. Homogeneous solid solution oxidizing composition. 3,697,340, Cl. 149-19.000.
Sweeney, Richard Francis: *See—*
Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, 3,697,564.
Sweeten, Orlin L.; and Abromavage, John C., to Advanced Management Engineering & Research Co. Carrousel multiphasic screening laboratory. 3,696,805, Cl. 128-2.00r.
Swensen, Eugene L.; and Gibson, Franklin E., to Liskey Aluminum Inc. Floor panel for an elevated floor assembly. 3,696,578, Cl. 52-618.000.
Switsen, Henry N. Gas discharge lamp firing circuit. 3,697,805, Cl. 315-241.00p.
Sybron Corporation: *See—*
Schneier, Michael Lawrence, 3,697,769.
Syeles, Albert M.: *See—*

Anderson, Wallace E.; Krall, Albert D.; and Syeles, Albert M., 3,697,831.
Synstad, Alvin R.; Burges, Luther M.; and Day, Paul P., to United States of America, Navy. Threaded ring turning device. 3,696,495, Cl. 29-240.000.
Synvar Associates: *See—*
Boocock, David G. B.; and Ullman, Edwin F., 3,697,538.
Leute, Richard K.; and Ullman, Edwin F., 3,697,535.
Syria, Ronald L.: *See—*
Verner, Dalton R.; and Syria, Ronald L., 3,697,719.
System for generating compensating signals for: *See—*
Greenberg, Myron M.; Macintyre, Steven A.; and United States of America, Navy, 3,697,869.
Syversen, Finn Kohler. Combined feeding and sorting device for sheet material. 3,696,926, Cl. 209-122.000.
Szabo, Andras I.: *See—*
Sarkozi, Miklos; Szabo, Andras I.; and Hite, Perry J., 3,697,896.
Szpur, Roman, to NDM Corporation, mesne. Medical electrode with relatively rigid electrolyte cup. 3,696,807, Cl. 128/0010e.
Tabler, Donald C.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,697,448.
Tachida, Hiroki, to Nippon Gakki Seizo Kabushiki Kaisha. Hammer flange mounting structure for use in piano. 3,696,699, Cl. 84-25.00.
Taiyo Kogyo Company Limited: *See—*
Itokawa, Hideo, 3,697,352.
Tajima, Tatsuya: *See—*
Tatsuta, Sumitaka; Ueno, Wataru; Tajima, Tatsuya; and Akao, Mutsuo, 3,697,305.
Takagi, Motoyoshi: *See—*
Watanabe, Masami; Namikawa, Keishi; Yasuda, Kotaro; and Takagi, Motoyoshi, 3,697,605.
Takagi, Tetitsu: *See—*
Iwai, Tadashi; Yamashina, Hisao; Takagi, Tetitsu; and Adachi, Shoichi, 3,697,386.
Takahashi, Satoshi: *See—*
Fukuoka, Ichiro; Kimura, Shoji; Nishimura, Takehiko; and Takahashi, Satoshi, 3,697,609.
Takahashi, Yoshio, to Pioneer Electronic Corporation. Automatic record player. 3,697,087, Cl. 274-23.00r.
Takao, Shuji: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.
Takeda Chemical Industries, Ltd.: *See—*
Imai, Yoshio; Matsumura, Haruki; Yurugi, Shojiro; and Miyake, Akio, 3,697,530.
Matsuoka, Toshiro; Takeda, Keinosuke; Goto, Minoru; and Miyake, Akira, 3,697,647.
Takeda, Keinosuke: *See—*
Matsuoka, Toshiro; Takeda, Keinosuke; Goto, Minoru; and Miyake, Akira, 3,697,647.
Takenaka, Haruo; Okiyama, Toshiaki; and Hiratsuka, Nobuo, to Fuji Photo Film Co., Ltd. Process for producing resistance films. 3,697,450, Cl. 252-511.000.
Takenaka, Osamu: *See—*
Imai, Takeshi; Matsubara, Tamotsu; and Takenaka, Osamu, 3,697,913.
Takenaka, Seisuke: *See—*
Yamanouchi, Akira; Takenaka, Seisuke; and Mitori, Yukio, 3,697,350.
Takimoto, Hisao: *See—*
Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Takimoto, Hisao, 3,697,637.
Talcott, Thomas D.: *See—*
Polmanteer, Keith E.; Willing, David N.; and Talcott, Thomas D., 3,697,473.
Tamag Basel A.G.: *See—*
Buchmann, Paul; and Beringer, Monique, 3,696,816.
Tampax Incorporated: *See—*
Jaycox, Willardr., 3,696,812.
Tanaka, Harumi, to Minolta Camera Co., Ltd. Exposure adjusting device in a camera. 3,696,718, Cl. 95-10.00c.
Taner, Mehmet Turhan, to Seismic Computing Corporation. Seismic prospecting with random injected signal. 3,697,938, Cl. 340-15.5ta.
Tanikoshi, Kinji, to Canon KabushikKaisha. Automatic exposure control device. 3,696,719, Cl. 95-10.0cd.
Tarasov, Vasily Mikhailovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.
Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., to General Electric Company. Superalloy segregate braze. 3,696,500, Cl. 29-487.000.
Tasman Vaccine Laboratory Limited: *See—*
Grant, Roy Arthur, 3,697,419.
Tate, Bryce E.; and Berg, Rudolph G., to Pfizer Inc. Iminodisuccinic acid salts as detergent builders. 3,697,453, Cl. 252-546.000.
Tatsuta, Sumitaka; Ueno, Wataru; Tajima, Tatsuya; and Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Method for producing a photographic element. 3,697,305, Cl. 117-47.00a.
Taylor, Donald F., Jr., to Otis Engineering Corporation. Well flow control valves and well systems utilizing the same. 3,696,868, Cl. 166-315.000.
Taylor, Earl Richard, Jr., to Du Pont de Nemours, E. I., and Company. Removal of dissolved organic lead from aqueous alkyl lead process effluents. 3,697,567, Cl. 260-437.00r.
Taylor, Glenn N., to Kendall Company, The. Smock or gown with adjustable belt. 3,696,443, Cl. 2-114.000.
Taylor, Larry H.; Porter, William D.; Anderson, William J.; and Caneer, Ralph A., to Northrop Carolina, Inc. Winding apparatus. 3,697,007, Cl. 242-18.0dd.
Taylor, Lloyd D.: *See—*
Rogers, Howard G.; and Taylor, Lloyd D., 3,697,279.
Taylor, Lytton: *See—*
Brouchu, Rene Robert; and Taylor, Lytton, 3,697,353.
Taylor, Robert L., to Hewlett-Packard Company. Power supply having means for limiting load currents with both active and passive loads. 3,697,862, Cl. 323-9.000.
Teague, Walter D., Jr., to Southern California Gas Co. Gas heater. 3,696,802, Cl. 126-110.00b.
Technicon Instruments Corporation: *See—*
Kassel, Aaron; and Kopelman, Donald F., 3,697,185.
Technology Marketing Incorporated: *See—*
Wells, George H.; and Persons, Perry B., 3,697,966.
Technomedic Corporation: *See—*
Gilmour, A. Scott, 3,696,675.
Teeter, George R. Drive sprocket for wide chain of drum cutting head. 3,697,136, Cl. 299-83.000.
Tehalit Kunststofoffwerk G.m.b.H., Firma: *See—*
Pollak, Gottfried; and Kolb, Peter, 3,697,667.
Teijin Limited: *See—*
Kurihara, Osamu; Kuramoto, Naoya; Kamiyoshi, Masaya; and Yamaguchi, Takeshi, 3,697,310.
Tektronix, Inc.: *See—*
Gilbert, Barrie, 3,697,785.
Olson, Ronald A., 3,697,778.
Teledyne, Inc.: *See—*
Caldwell, John W.; and Smith, Edward M., 3,697,799.
Youtz, Donald E.; and Eigenbrode, Edwin M., 3,696,454.
Teledyne Mid-American Corporation: *See—*
Elmore, Clifford L.; and Young, Richard C., 3,696,756.
Telefonaktiebolaget LM Ericsson: *See—*
More, Oskar Wilhelm, 3,696,781.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Kummerer, Karl-Heinz, 3,697,064.
Teletype Corporation: *See—*
Appel, Sherman P., 3,698,002.
Teletzke, Gerald H.; Knopp, Paul V.; and Erickson, Allen H., to Sterling Drug Inc. Heat treatment of sewage sludge. 3,697,417, Cl. 210-10.000.
Telex Computer Products, Inc.: *See—*
Fort, Larry W.; and Marshall, Connie T., 3,697,884.
Telfer, Dugald J.: *See—*
Patterson, Gordon I.; and Telfer, Dugald J., 3,697,746.
Teller, Alvin N., to Kinetic Technologies, Inc. Educational building toy modules with interior lights and mechanical connections acting as circuit closers. 3,696,548, Cl. 46-25.000.
Temple, Stephen, to Durcam Research and Development Company Limited. Method of and apparatus for locating a bit of material in a pile fabric. 3,697,344, Cl. 156-72.000.
Tenneco Chemicals, Inc.: *See—*
Rumanowski, Edmund J., 3,697,658.
Tenner, Arnold J., to Monsanto Company. Blow molding. 3,697,632, Cl. 264-40.
Tennessee Valley Authority: *See—*
Jones, Thomas M.; and Frazier, Alva W., 3,697,247.
Teno, Vincent N.: *See—*
Lodrick, Lester B.; and Teno, Vincent N., 3,696,582.
Terai, Akio; Kawamura, Eiji; Fukumoto, Hisashi; and Aoki, Hidekatsu, to Kabushiki Kaisha Komatsu Seisakusho. Heavy bulldozer. 3,696,879, Cl. 180-9.480.
Terasaki, Iwao: *See—*
Fujimuto, Yoshihisa; Kimura, Yoshio; Terasaki, Iwao; and Kitago, Takanobu, 3,697,230.
Terbrack, William H.: *See—*
Shade, Ross A.; and Terbrack, William H., 3,697,891.
Teschner, Kurt: *See—*
Kosziech, Karl-Heinz; and Teschner, Kurt, 3,697,024.
Tetrick, Elton E., to Sperry Rand Corporation. Snap action switch. 3,697,711, Cl. 200-67.0db.
Teuscher, Leon A.; Trubisky, Michael P.; Palermiti, Frank M.; and Levine, Charles J., to Xerox Corporation. Vitreous selenium alloy matrix containing isolated particles and particle networks of resin. 3,697,265, Cl. 96-1.500.
Texas Instruments, Incorporated: *See—*
Brassard, Theodore, 3,697,915.
Dromsky, John A., 3,696,499.
Ensminger, Clifford H.; and Ruggiero, Edward M., 3,698,012.
Kilner, Olive H., 3,697,863.
Stehlin, Robert A., 3,697,337.
Textron, Inc.: *See—*

Burk, Charles R., 3,696,483.
Radune, Karl F., 3,696,485.
Readyhough, Peter A., 3,696,701.
Reynolds, Rolfe E.; and Carlile, Alfred E., 3,696,470.
Van Dorn, Horace B.; Matt, Richard J.; and Rolland, Thomas P., 3,697,346.

Tezuka, Kunitoshi. Apparatus for forming packed refuse blocks. 3,696,583, Cl. 53-124.00d.

Thiokol Chemical Corporation: *See—*
Desjardins, Stanley P.; Canfield, Alan R.; and Wilson, Jonathan W., 3,696,999.
Gallagher, John P.; Meyers, Robert M.; Sorg, Earl H.; and Willitts, Clark M., 3,697,472.

Thomas & Betts Corporation: *See—*
O'Loughlin, Francis A.; and Herb, Philip J., 3,697,669.
Sinclair, William Y., 3,696,506.

Thomas, David F.: *See—*
Berglund, Harold A.; and Thomas, David F., 3,697,197.

Thomas, Edmund P.: *See—*
Ness, Leif A.; and Thomas, Edmund P., 3,696,637.

Thomas, Ieuan: *See—*
Andrews, Timothy Douglas; Short, Glynn David; and Thomas, Ieuan, 3,697,528.

Thompson, Bernard C., 1/2 to Sherman, William P. Soap bar attachment device. 3,697,111, Cl. 294-64.000.

Thompson, Edward A.: *See—*
Carpenter, David B.; and Thompson, Edward A., 3,697,414.

Thompson, Edward J., to Upjohn Company, The. Method of preparing organic isocyanates in the presence of molecular sieves. 3,697,570, Cl. 260-453.0ph.

Thompson, Howard D. Tube float or boat. 3,696,451, Cl. 9-2.00a.

Thompson, John F., to Weaver, W. R., Company. Scope tube with ocular retainer ring. 3,696,516, Cl. 33-245.000.

Thompson, Raymond V., to Chandler Evans Inc. Vertical lift machine. 3,697,020, Cl. 244-12.000.

Thompson, Richard D.: *See—*
Beeley, Michael G.; and Thompson, Richard D., 3,696,523.

Thompson, William M. Therapeutic rocker having lateral and longitudinal rocking motion. 3,697,131, Cl. 297-258.000.

Thomson, J. Brent, to Hercules Incorporated. Silane sulfonyl azides. 3,697,551, Cl. 260-349.000.

Thor Power Tool Company: *See—*
Vonhoff, William, Jr., 3,696,834.

Thorsell, Leif Urban Folke: *See—*
Weibull, Bengt J. G.; Thorsell, Leif Urban Folke; and Lindstrom, Sven-Olof, 3,697,598.

Thorud, Richard A.; Snegoski, James J.; and Hasenbank, Kenneth N., to Toro Manufacturing Corporation. Electric start for mowers. 3,696,593, Cl. 56-17.500.

Three Way, Inc.: *See—*
Hinson, James L., 3,696,870.

Tibbetts, George C.: *See—*
Flint, William T.; and Tibbetts, George C., 3,697,790.

Tibbott, David W., to Ingersoll-Rand Company. Pneumatic motor governor. 3,697,189, Cl. 415-36.000.

Tidball, Robert A., to Aerojet-General Corporation, mesne. Flash distillation apparatus and method. 3,697,385, Cl. 203-11.000.

Tiffin, James R.; and Trimble, David C., to Haskon, Inc. Reinforced foam headliner. 3,697,126, Cl. 296-137.00a.

Time, Incorporated: *See—*
Lopas, Kasimir, 3,696,708.

Timmons, William P.: *See—*
Johnson, Lemoine L.; and Timmons, William P., 3,696,666.

Timson, William J., to Polaroid Corporation. Novel photographic products and processes. 3,697,269, Cl. 96-3.000.

Timson, William J., to Polaroid Corporation. Novel photographic products and processes. 3,697,270, Cl. 96-3.000.

Timson, William J., to Polaroid Corporation. Novel photographic products and processes for color diffusion transfer utilizing silver halide emulsions with specific proportions of average halide grain size. 3,697,271, Cl. 96-3.000.

Titemore, Robert George: *See—*
Lester, Frank Backus; Laurent, Robert Parker; and Titemore, Robert George, 3,696,704.

Titt, Georg. Two-stage worm gear transmission. 3,696,691, Cl. 74-797.000.

Tjon, Harry X.: *See—*
Ross, Richard J.; and Tjon, Harry X., 3,697,205.

Tohma, Wataru; Murata, Takao; Nakamura, Nobutaka; and Kudo, Atsushi, to Sumitomo Durez Company, Limited and Sumitomo Chemical Company, Limited. Method of soil stabilization and leakage prevention. 3,696,622, Cl. 61-36.00r.

Toi, Tatsuo: *See—*
Murai, Tsuyoshi; and Toi, Tatsuo, 3,696,779.

Tojza, Roman A.; and De Simone, Frank C., to Bally Manufacturing Corporation. Coin escrow means and circuit. 3,696,905, Cl. 194-9.000.

Toki, Hisashi: *See—*
Yamamoto, Masayuki; Toki, Hisashi; and Shibuya, Hideo, 3,697,334.

Tokura, Tadao, to NGK Insulators, Ltd. Horizontal compression type automatic filter press. 3,696,930, Cl. 210-225.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichinose, Noboru; Egami, Harutoshi; Yokoyama, Katsunori; and Yamashita, Yohachi, 3,697,430.
Kojima, Mikiharu; and Iwata, Tetuo, 3,696,909.

Tokyo Tokei Seizo Kaisha, Ltd.: *See—*
Kawaki, Katsumi; and Usui, Masashi, 3,697,982.

Tole, Walter Roland: *See—*
Kyriakis, John; and Tole, Walter Roland, 3,697,335.

Toledo, Emil: *See—*
Rotondo, Fortunato N.; Toledo, Emil; and Lawrence, Leslie, 3,696,846.

Tomalia, Donald A.; and Ooha, Narayanlal D., to Dow Chemical Company, The. Process for preparing 1,4-disubstituted piperazines. 3,697,524, Cl. 260-268.0st.

Tomalia, Donald A., to Dow Chemical Company, The. 2-(Aryloxy)-2-thiazolinium compounds. 3,697,537, Cl. 260-306.700.

Tomezsko, Edward S. J., to Atlantic Richfield Company. Catalytic oxidative dehydrogenation of paraffin. 3,697,614, Cl. 260-683.300.

Tomita, Teiji: *See—*
Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Tonsbeek, Christiaan Herman Theodoor, to Lever Brothers Company. Furanone meat flavor compositions. 3,697,291, Cl. 99-107.000.

Toole, Pierce C., to United States of America, National Aeronautics and Space Administration. High speed direct binary to binary coded decimal converter and scaler. 3,697,733, Cl. 235-155.000.

Toole, Richard Charles: *See—*
Nacci, George Raymond; and Toole, Richard Charles, 3,698,005.

Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., to Dempster Brothers, Inc. Refuse collection vehicles. 3,696,951, Cl. 214-83.300.

Torii, Masaru, to Brother Kogyo Kabushiki Kaisha. Ornamental zigzag stitch sewing machine. 3,696,768, Cl. 112-158.00r.

Torning, Ralph R.: *See—*
Kennedy, Ralph C.; and Torning, Ralph R., 3,696,543.

Toro Manufacturing Corporation: *See—*
Thorud, Richard A.; Snegoski, James J.; and Hasenbank, Kenneth N., 3,696,593.

Torr Laboratories, Inc.: *See—*
De Lucia, Victor E., 3,697,907.

Townsend, Franklin L., to Barber-Colman Company. Warp clamp. 3,696,477, Cl. 28-44.000.

TPI & Company: *See—*
Schmidlin, Albertus E., 3,696,709.

Trane Company, The: *See—*
Webb, Ralph L., 3,696,861.

Tranly Walls and Mini Courts (Proprietary) Limited: *See—*
Mc Dougall, Julia P., 3,697,068.

Transportation Technology, Inc.: *See—*
Ross, Howard R.; Goodrich, Lloyd D.; and Mc Queen, Norman, 3,696,753.

Tremblay, Maurice H.: *See—*
Brown, Perry H.; Tremblay, Maurice H.; and Surprenant, Norman F., 3,697,238.

Tri W-G, Inc.: *See—*
Wieland, Roman G., 3,697,066.

Tridair Industries: *See—*
Parris, Peter P., 3,696,759.

Trimble, David C.: *See—*
Tiffin, James R.; and Trimble, David C., 3,697,126.

Trimble, Robert L., to Sinclair-Koppers Company. Foamed polymer particles of distinctive shape and method of making same. 3,697,454, Cl. 260-2.50b.

Trocki, Thomas: *See—*
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, 3,697,376.

Troeger, Gottfried; Mueller, Gerhart Hermann; Bachmann, Gerhard; Spoor, Herbert; and Batzill, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Coating materials for the production of electrodepositable coatings. 3,697,461, Cl. 260-19.00u.

Tropello, Sam Duane: *See—*
Jacisin, Joseph Michael; and Tropello, Sam Duane, 3,697,089.

Troxell, Harold M. Flight control system. 3,696,550, Cl. 46-77.000.

Trubetskov, Kirill Mikhailvoch: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Trubisky, Michael P.: *See—*
Teuscher, Leon A.; Trubisky, Michael P.; Palermiti, Frank M.; and Levine, Charles J., 3,697,265.

True Temper Corporation: *See—*
Portz, William E.; and Stump, Harry B., 3,697,110.

TRW Inc.: *See—*
Beck, Alfred B., 3,697,895.

Brenneke, Arthur M., 3,697,090.
Grabill, Paul J., Jr.; and Suttkus, David J., 3,696,615.
Lubowitz, Hyman R.; and Vaughan, Robert W., 3,697,308.
Staudhammer, Karl P.; and Reineking, Vernon H., 3,697,634.
Vaughan, Robert W.; and Lubowitz, Hyman R., 3,697,345.
Tschunt, Edgar, to Siemens Aktiengesellschaft. Apparatus for radiation diagnosis. 3,697,751, Cl. 250-50.000.
Tsuchimochi, Yoshihisa: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,696,558.
Tsuji, Shoichi, to Ishikawajima Harima Jukogyo Kabushiki Kaisha. Rotary plate oil burner. 3,697,214, Cl. 431-168.000.
Tsuruoka, Takashi: *See—*
Shomura, Takashi; Ezaki, Norio; Tsuruoka, Takashi; Niwa, Tomizo; Akita, Eiichi; and Niida, Taro, 3,697,648.
Tumilty, Thomas George, to Northern Electric Company, Limited. Wire wrapping tool. 3,696,482, Cl. 29-33.00f.
Turbo Machine Company: *See—*
Lohrke, James L., Jr., 3,696,467.
Turner, Donald B.: *See—*
Murdoch, Kenneth E.; and Turner, Donald B., 3,696,948.
Turner, John O., to Sun Oil Company. Novel process for preparing a haloether. 3,697,603, Cl. 260-614.00a.
Turner, Thomas Adkins: *See—*
Harris, Julian Taylor; and Turner, Thomas Adkins, 3,697,974.
Turnhout, Jan Van, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid Handel en Verkeer. Unilaterally metallized electret foil. 3,696,505, Cl. 29-592.000.
Tuskos, Michael E. Pleating device. 3,696,515, Cl. 33-192.000.
Tutt, Richard D., to Lear Siegler, Inc. Air distributing apparatus. 3,696,731, Cl. 98-41.000.
Tyco Laboratories, Inc.: *See—*
Mermelstein, Seymour, 3,696,471.
Tyler, Norvel P. Telephone system including atmospheric pressure telemetering means. 3,697,694, Cl. 179-2.00r.
U. S. Plywood-Champion Papers Inc.: *See—*
Lee, Hong Man, 3,696,958.
Ube Industries, Ltd.: *See—*
Iwai, Tadashi; Yamashina, Hisao; Takagi, Tetitsu; and Adachi, Shoichi, 3,697,386.
Uber, Jay J.; and Dirks, Johan F. Sensitizable coated paper sheet adapted for photoelectrostatic reproduction. 3,697,267, Cl. 96-1.800.
Uchida, Koji; and Kuriu, Sadao, to Mitsubishi Paper Mills, Ltd. Method for retouching an electrophotographic offset master plate. 3,697,304, Cl. 117-37.00r.
Uchida, Michio, to Richo Co., Ltd. On-off servomechanism controlled by a wheat stone bridge. 3,697,849, Cl. 318-674.000.
Ueno, Katsumi; Oshima, Takao; and Seki, Hideo, to Sumitomo Chemical Co., Ltd. Method for the polymerization of a compounds containing an oxirane group. 3,697,496, Cl. 260-88.30a.
Ueno, Wataru: *See—*
Tatsuta, Sumitaka; Ueno, Wataru; Tajima, Tatsuya; and Akao, Mutsuo, 3,697,305.
Ugine Kuhlmann: *See—*
Allirot, Rene Joseph; Darcas, Claude; and Jobert, Raymond, 3,697,576.
Ullman, Edwin F.: *See—*
Boocock, David G. B.; and Ullman, Edwin F., 3,697,538.
Leute, Richard K.; and Ullman, Edwin F., 3,697,535.
Ullman, John E.; and Rollings, Ernest J., Jr., to United States Steel Corporation. Spool valve with internal passage. 3,696,838, Cl. 137-625.380.
Ulmer, Harry E.: *See—*
Wells, Rodney L.; Ulmer, Harry E.; and Mason, Paul J., 3,697,249.
Umbaugh, Charles Wayne, to General Electric Company. Electromagnetic force system for integrated circuit fabrication. 3,697,837, Cl. 318-119.000.
Umemoto, Samuel Junji. Cooling head gear. 3,696,814, Cl. 128-380.000.
Uneeda Doll Co., Inc.: *See—*
Sklarsky, Bernard B.; and Ostrander, Robert K., 3,696,551.
Unger, Robert W.; and Sunderman, Wallace H., to Emerson Electric Co. Method and apparatus for making electric heater. 3,696,507, Cl. 29-611.000.
Union Carbide Corporation: *See—*
Aleckner, John F., Jr., 3,697,311.
Freudewald, Joachim E.; and Konrad, Frederic M., 3,697,606.
Smith, Percy L.; and Comstock, Lowell R., 3,697,625.
Union Oil Company of California: *See—*
Fenton, Donald M., 3,697,600.
Holm, Le Roy W., 3,697,424.
Uniroyal Englebert France S.A.: *See—*
Leblond, Jean; and Biet, Jean, 3,696,949.
United Aircraft Corporation: *See—*
Hayes, Charles W., 3,697,192.
Skolnick, Michael L.; and Buczek, Carl J., 3,697,151.
United Kingdom Atomic Energy Authority: *See—*
Kealy, Wellesley Ashe, 3,697,979.
United States of America
Agriculture: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,697,316.
Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,603.
Mayer, Mayer, Jr.; Kotter, James I.; Salaun, Harold L., Jr.; and Brown, Roger S., 3,696,600.
Army: *See—*
Harp, Richard D.; and Williams, Lyle G., 3,696,561.
Klausner, Arnold, 3,697,988.
Meier, Eugene P.; Lenz, David E.; and Sternberger, Ludwig A., 3,697,645.
Picard, Jean P.; Seals, William O.; and Pell, Lawrence W., 3,696,748.
Slauta, John, 3,696,474.
Atomic Energy Commission: *See—*
Acree, Elick H.; Brashear, Hugh R., Jr.; and Case, Forrest N., 3,697,756.
Bunker, James F.; Poland, James E.; Sayell, Emerson H.; and Schmidt, George V., 3,697,329.
Coppinger, Eugene A.; and Johnson, Benjamin M., 3,697,436.
Emon, Donald E.; and Riley, Donald R., 3,697,373.
Knight, Rodney W.; Martin, Melvin M.; and Martin, William R., 3,697,374.
Ogle, Pearl R., Jr., 3,697,235.
Petit, George S.; and Kienberger, Charles A., 3,697,441.
Schmitt, Charles R., 3,697,317.
Werner, William J., 3,697,259.
Interior: *See—*
Dryden, Julian R., 3,696,866.
McCawley, Frank X.; Wyche, Charlie; and Schlain, David, 3,697,390.
National Aeronautics and Space Administration: *See—*
Howard, Frank S., 3,697,021.
Toole, Pierce C., 3,697,733.
Yoshino, Stanley Y., 3,697,630.
National Aeronautics and Space Administration; Acting Administrator; with respect to an invention of:
Baughman, James R.; Spies, Robert; and Hays, Lance G. Observation window for a gas confining chamber. 3,696,833, Cl. 137-559.000.
Deo, Narsingh. Dual purpose momentum wheels for spacecraft with magnetic recording. 3,697,968, Cl. 340-174.10r.
Lushbaugh, Warren A.; and Lyland, James W. Versatile arithmetic unit for high speed sequential decoder. 3,697,950, Cl. 340-146.1aq.
Navy: *See—*
Anderson, Wallace E.; Krall, Albert D.; and Syeles, Albert M., 3,697,831.
Conn, James B.; Delbauve, J. Richard; and Lilienkamp, Hugh, 3,697,886.
Crippa, Eugene R.; and Lowry, Ray B., 3,697,969.
Erickson, Allen M.; and Kessler, Bernard V., 3,697,182.
Greenberg, Myron M.; Macintyre, Steven A.; and United States of America, Navy, 3,697,869.
Huang, Kwang-Ta, 3,697,856.
Johnson, Frithiof V., 3,697,154.
Kissinger, Lewis E., 3,696,747.
Lagally, Paul, 3,697,425.
Lagally, Paul, 3,697,476.
Mackie, William L., 3,697,422.
Morris, Ross E., 3,696,773.
O'Daniel, Stephen A., 3,697,994.
Palmer, Donald M.; Cotton, Charles C.; and Hodges, Willmer F., 3,696,599.
Rotondo, Fortunato N.; Toledo, Emil; and Lawrence, Leslie, 3,696,846.
Shefler, Sydney, 3,697,434.
Simms, Bernard B.; Stein, Alvin A.; and Larosa, Charles N., 3,696,621.
Swedenberg, Clyde J.; and Cziesla, Manfred J., 3,697,340.
Synstad, Alvin R.; Burges, Luther M.; and Day, Paul P., 3,696,495.
Watson, James K., 3,697,019.
Navy, mesne: *See—*
Brady, Jack C.; and Fewel, Kenneth J., 3,696,894.
Colgate, Stirling A.; Kempton, Marvin L.; Hanson, Merle E.; Munson, William O.; and Nicholson, Dallas E., 3,696,750.
Emch, George F., 3,697,990.
Healey, Daniel J., III; and Driscoll, Michael M., 3,697,890.
Kempton, Marvin L., 3,696,751.
Kleptz, James A.; and Bissell, George H., 3,697,992.
United States Steel Corporation: *See—*
Ullman, John E.; and Rollings, Ernest J., Jr., 3,696,838.
Unitrade Corporation: *See—*
Simon, Edward, 3,697,827.
Universal Instruments Corporation: *See—*
Ragard, Phillip A., 3,696,713.
Universal Oil Products Company: *See—*
Boyd, David M.; and Gerhold, Clarence G., 3,696,618.
Carson, Don B.; and Hennemuth, William R., 3,697,416.
Hamblin, Robert J. J., 3,697,413.
University of Toronto, The Governors of the: *See—*
Ribner, Herbert S.; and Siddon, Thomas E., 3,696,673.
Unwenehr, Lewis E., to Ford Motor Company. Bridge circuit controller and process for supplying electrical energy to a variable reluctance motor. 3,697,839, Cl. 318-138.000.

Upjohn Company, The: *See—*
Argoudelis, Alexander D.; Coats, John H.; and Pyke, Thomas R., 3,697,380.
Bannister, Brian, 3,697,503.
Jahnke, Heinz K.; and Meyer, Heinz F., 3,697,557.
Thompson, Edward J., 3,697,570.

Urech, Jakob: *See—*
Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, 3,697,515.

Urifu, Tohoru: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.

Urwin, Peter T., to Electrohome Limited. Dual control mechanism. 3,697,921, Cl. 338-131.000.

U.S. Philips Corporation: *See—*
Daniels, Alexander, 3,696,626.
Eulenberg, Hannspeter, 3,697,801.
Lesare, Paul, 3,697,684.
Meuleman, Johannes; and Aussant, Michel, 3,697,825.
Moulding, Kenneth William, 3,697,784.
Schroder, Johann, 3,697,239.
van den Plassche, Rudy Johan, 3,697,882.
Von Marinelli, Silvio M.N.K.W.F.; Vree, Jules Herman; and Verboom, Joannes B., 3,696,512.

Ushiyama, Keichi: *See—*
Irikura, Tsutomu; Nishino, Keigo; Suzue, Seigo; Ushiyama, Keichi; and Shinada, Hirotaka, 3,697,577.

USM Corporation: *See—*
Kitchener, Charles J.; and Rumball, Paul G., 3,696,942.
Kyritsis, William T.; and Simmonds, Robert C., Jr., 3,697,204.

Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Usui, Masayoshi, 3,697,399.

Usui, Masashi: *See—*
Kawaki, Katsumi; and Usui, Masashi, 3,697,982.

Usui, Masayoshi, to Usui Kokusai Sangyo Kabushiki Kaisha. Method of continuously plating a steel strap on one surface. 3,697,399, Cl. 204-15.000.

Uyeda, Yoshio: *See—*
Lee, Leonard S.; Uyeda, Yoshio; and Heneghan, Leo F., 3,697,322.

Uzinele Electronica Bucharest: *See—*
Georgescu, Gheorghe, 3,697,878.

Vald Henriksen A/S: *See—*
Henningsen, Erik; and Nielsen, Hans Borge, 3,696,645.

Valdes, Pelayo F. Integrated modular refrigeration system. 3,696,631, Cl. 62-282.000.

Van Baarn, Paul S., to Captocap Limited. Fluid-tigh, flexible and tamper-proof caps for containers having a matching neck profile. 3,696,957, Cl. 215-41.000.

Van De Velde, Valere: *See—*
Decker, Wilton K.; and Van De Velde, Valere F. (said Decker assor. to said), 3,697,738.

Van De Velde, Valere F.: *See—*
Decker, Wilton K.; and Van De Velde, Valere F., 3,697,738.

Van Den Ouweland, Godefridus Antonius Maria; and Peer, Henricus Gerardus, to Lever Brothers Company. Flavouring substances. 3,697,295, Cl. 99-140.00r.

van den Plassche, Rudy Johan, to U.S. Philips Corporation. Amplifier circuit. 3,697,882, Cl. 330-15.000.

Van Der Veken. Apparatus for transferring a product, liquid or suchlike in a liquid. 3,696,974, Cl. 222-251.000.

Van Dijk, Jan, to Shell Oil Company. Industrial furnace. 3,696,862, Cl. 165-178.000.

Van Dorn, Horace B.; Matt, Richard J.; and Rolland, Thomas P., to Textron Inc. Method of making a composite plastic bearing. 3,697,346, Cl. 156-161.000.

Van Dyck, Ken: *See—*
De Van, William T.; and Van Dyck, Ken, 3,696,969.

Van Dyke Tiers, George: *See—*
Rambosek, George M.; Allen, Michael George; and Van Dyke Tiers, George, 3,697,485.

Van Heeckeren, Jacob; Rodal, David R.; and Markevitch, Bob V., to Ampex Corporation. Fourier transform holographic storage and retrieval system. 3,697,149, Cl. 350-3.500.

Van Klinken, Jakob; Kouwenhoven, Herman Wouter; and Van Weeren, Pieter Aldert, to Shell Oil Company. Preparation and use of silica/alumina-based hydrocarbon conversion catalyst. 3,697,444, Cl. 252-451.00.

Van Leer (U.K.) Limited: *See—*
Fehres, Hans; and Boogert, Lucas W. P., 3,696,962.

Van Nassau, Petrus J. M.; Brand, Wilhelmus K.; and Kaasenbrood, Petrus J. C., to Stamicarbon N.V. Integrated process for the preparation of urea and melamine. 3,697,521, Cl. 260-249.70a.

van Roosbroeck, Willy Werner: *See—*
Casey, Horace Craig, Jr.; and van Roosbroeck, Willy Werner, 3,697,834.

van Santen, Aart: *See—*
Suvanto, Antti; and van Santen, Aart, 3,697,375.

Van Sickle, John. Detachable vehicle glare shield. 3,697,125, Cl. 296-97.00c.

Van Surksum, Edwin J., to Mastercraft Furniture Corporation. Multiposition lock-rock rocker and rocking type reclining chair. 3,697,132, Cl. 297-269.000.

Van Weeren, Pieter Aldert: *See—*
Van Klinken, Jakob; Kouwenhoven, Herman Wouter; and Van Weeren, Pieter Aldert, 3,697,444.

Van Wierst, Wilhelmus Lambertus; and Paffen, Pieter Jozef Marie, to Kominklyke Nederlandsche Hoogodns en Staalfabrieken N. V. Railway wheel and axle assembly. 3,697,119, Cl. 295-36.00r.

Vander Wall, Eugene M.: *See—*
Lucas, James M.; Suder, Jack K.; and Vander Wall, Eugene M., 3,696,616.

Vanderbilt, R. T., Company, Inc.: *See—*
DeHoff, Ronald Lee, 3,697,462.

Vanguard Industries, Inc.: *See—*
Herolzer, Ralph H., 3,696,966.

Vapor Corporation: *See—*
Patterson, Gordon I.; and Telfer, Dugald J., 3,697,746.

Varian Adco: *See—*
Anstin, Wayne D., 3,697,680.

Vaughan, Robert W.: *See—*
Lubowitz, Hyman R.; and Vaughan, Robert W., 3,697,308.

Vaughan, Robert W.; and Lubowitz, Hyman R., to TRW Inc. Process for preparing polyimide laminates. 3,697,345, Cl. 156-155.000.

Veb Druckmaschinenwerk Planeta: *See—*
Johne, Hans; Schumann, Gunter; and Reichenberger, Kurt, 3,696,743.

Veb Wtz fur Bekleidungstechnik: *See—*
Glasow, Gunthard; Grosse, Klaus; Hykel, Knut; Schleifer, Werner; Karste, Eberhard; and Kliehe, Helmut, 3,696,766.

Vecchi, John C., to Oberg Manufacturing Co., Inc. Die assembly and disassembly bench. 3,696,489, Cl. 29-200.00d.

Vegliante, Donald E.: *See—*
Kranyik, Robert Donald; Vegliante, Donald E.; and Balmer, Donald F., 3,696,524.

Venier, Domic A.: *See—*
Mefford, Carl R.; Lass, James L.; Smith, Bart A.; Venier, Domic A.; and Trocki, Thomas, 3,697,376.

Ventron Corporation: *See—*
Wade, Robert C., 3,697,232.

Vepa AG: *See—*
Fleissner, Heinz, 3,696,475.

Verboom, Joannes B.: *See—*
Von Marinelli, Silvio M.N.K.W.F.; Vree, Jules Herman; and Verboom, Joannes B., 3,696,512.

Verein zur Forderung der Feslkorperphysik an der Edgenossischen Technischen Hochschule: *See—*
Busch, Georg; and Wachter, Peter, 3,697,688.

Vernay Laboratories, Inc.: *See—*
Gifford, Robert T., 3,696,997.

Verner, Dalton R.; and Syria, Ronald L., to Elox Inc. Pulse narrowing and cut-off protection system for electrical discharge machining. 3,697,719, Cl. 219-69.00s.

Verstegen, Willi, to International Standard Electric Corporation. Method for the signal exchange in telecommunication, particularly telephone exchanges employing time-division multiplexing. 3,697,696, Cl. 179-15.

Victor Company of Japan, Ltd.: *See—*
Iwata, Mitsuo, 3,697,015.

Viewlex, Inc., mesne: *See—*
Kongelka, Robert Michael, 3,696,899.

Villaneu, Michel, to IBS Industrialized Building Systems, Incorporated. Prefabricated building panel having positioner means. 3,696,567, Cl. 52-98.000.

Villasana, Armando P.: *See—*
Lewis, J. Stephen; Sapkus, Jurgis; and Villasana, Armando P., 3,696,553.

Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, to Societe en nom Collectif Science Union et Cie Societe Francaise de Recherche Medicale-Suresnes. Cyclohexenyl acetic acid compounds. 3,697,588, Cl. 260-514.00r.

Vinson, Billy H., to Integrated Controls, Inc. Method and apparatus for photographing oscilloscope traces with conventional camera. 3,696,720, Cl. 95-10.00c.

Vischer, Ernst: *See—*
Fechtig, Bruno; Vischer, Ernst; Bickel, Hans; Bosshardt, Rolf; and Urech, Jakob, 3,697,515.

Vogel, Charles B. Board game apparatus. 3,697,076, Cl. 273-131.00a.

Voigt, Hartmut: *See—*
Burba, Christian; Drawert, Manfred; Voigt, Hartmut; and Griebsch, Eugen, 3,697,458.

Volker, Theodor; and Hering, Klaus, to Lonza Ltd. Process for producing acrylic acid esters. 3,697,583, Cl. 260-486.00r.

Volkswagenwerk AG: *See—*
Ehrenberg, Hans Joachim, 3,697,213.

Vom Rath, Herbert: *See—*
Kundt, Edmund; Klaiber, Max; Leitz, Wilfried; and Vom Rath, Herbert, 3,696,955.

Von Hippel, Eric A., to Graphic Sciences, Inc. Electro-sensitive printing resin control system. 3,697,691, Cl. 178-94.000.

Von Hofe, George W., to New Jersey Machine Corporation. Continuous strip of label web. 3,697,300, Cl. 117-15.000.

Von Hollen, Dieter; and Holder, Heinz, to Mannesmann Aktiengesellschaft. Method for manufacturing welded pipes tubes with helical seam. 3,697,718, Cl. 219-62.000.

Von Marinelli, Silvio M.N.K.W.F.; Vree, Jules Herman; and Verboom, Joannes B., to U.S. Philips Corporation. Extensometer. 3,696,512, Cl. 33-147.00d.

Von Starck, Axel: *See—*
Seulen, Gerhard; and Von Starck, Axel, 3,696,858.
Vonhoff, William, Jr., to Thor Power Tool Company. Fluid control device. 3,696,834, Cl. 137-596.000.
Voorhees, Steven C.: *See—*
Toppins, Charles R.; Harvey, Samuel E.; Liberman, Harvey W.; Ratledge, Houston; and Voorhees, Steven C., 3,696,951.
Voss, Harold C.: *See—*
Bixler, William L.; and Voss, Harold C., 3,696,511.
Vree, Jules Herman: *See—*
Von Marinelli, Silvio M.N.K.W.F.; Vree, Jules Herman; and Verboom, Joannes B., 3,696,512.
Vshivkov, Boris Alexandrovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.
Wachter, Peter: *See—*
Busch, Georg; and Wachter, Peter, 3,697,688.
Waddan, Dhafir; and Williams, Derek, to Imperial Chemical Industries, Limited. Preparation of 2,2'-bipyridyl. 3,697,534, Cl. 260-296.000.
Wade, Robert C., to Ventron Corporation. Preparation of potassium cyanoborohydride. 3,697,232, Cl. 23-358.
Wagner Electric Corporation: *See—*
Demas, Nickolas P., 3,697,802.
Marting, Paul G., 3,697,138.
Wagner, Herbert: *See—*
Machenschalk, Rudolf; and Wagner, Herbert, 3,697,798.
Wagner, Karl, to Agfa-Gevaert Aktiengesellschaft. Automatic distance warning circuits for cameras to be used with photoflash units. 3,696,721, Cl. 95-11.00r.
Wagner, Raymond P.: *See—*
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.
Wagner, Robert L.: *See—*
Bagland, Evan L., III; and Wagner, Robert L., 3,696,739.
Waid, J. M., to Shell Oil Company. Resin consolidated sandpack. 3,696,867, Cl. 166-276.000.
Wakley, Wilbur T.; and Leeds, Michael T., to Diacon, Inc. Enclosure for incapsulating electronic components. 3,697,666, Cl. 174-52.00s.
Walker, Archie L. Fly reel. 3,697,012, Cl. 242-84.51r.
Walker Bank and Trust Co.: *See—*
Brimhall, Ray S., 3,697,412.
Walker, Douglas J.: *See—*
Bunnell, Douglas E.; and Walker, Douglas J., 3,696,970.
Walker, Harry L., to Phillips Petroleum Company. Fractionation control system and process with plural feed stream controls. 3,697,384, Cl. 203-1.000.
Walker, Howard R., to Podgor, Joseph E., Inc. Silk screen stencil apparatus and method. 3,696,738, Cl. 101-38.000.
Walker, James L.: *See—*
Tarshis, Lemuel A.; Walker, James L.; and Berry, Thomas F., 3,696,500.
Wallace, David B. Winch drum drive and control. 3,697,049, Cl. 254-187.00r.
Wallach, Ronald M., to Cryomedics, Inc. Cryosurgical instrument. 3,696,813, Cl. 128-303.100.
Wallberg, Eric W.: *See—*
Ekfeldt, Axel E.; and Wallberg, Eric W., 3,696,542.
Walter, E Richard: *See—*
Bernstein, Karl; and Walter, E Richard, 3,697,975.
Waltz, Edward, to Bulman, E. O., Manufacturing Co., Inc., The. Hand-held tape dispenser. 3,696,980, Cl. 225-66.000.
Walworth Company: *See—*
Kilian, Henry R., 3,697,042.
Wang, Chao Chen: *See—*
Macek, Warren M.; and Wang, Chao Chen, 3,697,181.
Waplington, Geld A. P., to Garnet Products Limited. Dial assemblies. 3,696,776, Cl. 116-115.500.
Ward, V. F., mesne: *See—*
Brewington, Doyle W., 3,697,674.
Wargat, Edward: *See—*
Dunne, Owen F.; Hebert, William E.; Souza, Ronald; and Wargat, Edward, 3,696,770.
Warner & Swasey Company, The: *See—*
Joyce, Glover C., 3,696,564.
Warner & Swasey Company, The, mesne: *See—*
Mrugala, Theodore A.; and Kruck, Henry, 3,696,487.
Warner, Gene: *See—*
Hatcher, Cecil W.; and Warner, Gene, 3,697,135.
Watanabe, Masami; Namikawa, Keishi; Yasuda, Kotaro; and Takagi, Motoyoshi, to Nippon Mining Co., Ltd. Process for producing alcohols. 3,697,605, Cl. 260-618.
Watanabe, Tadayoshi: *See—*
Shinoda, Kiyonori; Watanabe, Tadayoshi; and Mizusawa, Shigeru, 3,697,443.
Watanabe, Tetsuo; Oikawa, Akira; and Masayoshi, Kuroda, to Bridgestone Tire Company Limited. Bias ply tire having a breaker with glass cords. 3,696,854, Cl. 152-361.000.
Watarai, Syu: *See—*
Ono, Hisatake; Osada, Chiakai; Watarai, Syu; and Katsuyama, Harumi, 3,697,266.
Waterous Company: *See—*
Berglund, Harold A.; and Thomas, David F., 3,697,197.
Watson, James K., to United States of America, Navy. Stabilizing fin assembly. 3,697,019, Cl. 244-3.290.
Watson, Searcy A. Two-part hinge with integral pin. 3,696,463, Cl. 16-178.000.
Weaver, Earle R., to General Electric Company. Feedwater heater and strainer arrangement for multiple-effect ting film desalination plant. 3,697,383, Cl. 202-174.000.
Weaver, Paul J., to Automatic Control Systems, Inc. Tool offset means for tracer mechanisms. 3,697,040, Cl. 251-3.000.
Weaver, W. R., Company: *See—*
Thompson, John F., 3,696,516.
Webb, George, to Avco Corporation. Recoil pad. 3,696,544, Cl. 42-74.000.
Webb, Ralph L., to Trane Company, The. Heat transfer surface having a high boiling heat transfer coefficient. 3,696,861, Cl. 165-133.000.
Weber, Carl. Vending machine. 3,697,148, Cl. 312-268.
Weber, Robert L., to Scovill Manufacturing Company. Hair-drying comb. 3,696,818, Cl. 132-9.000.
Wegscheid, Stanley C. Watermelon harvesting device. 3,696,596, Cl. 56-327.
Wehmeier, Gilbert E.: *See—*
Fernkopf, Forrest D.; and Wehmeier, Gilbert E., 3,697,159.
Weibull, Bengt J. G.; Thorsell, Leif Urban Folke; and Lindstrom, Sven-Olof, to Mo och Aktiebolag Ornskoldsvik. Continuous process for preparing monoalkanolamines from ammonia and alkylene oxides. 3,697,598, Cl. 260-584.000.
Weichel, Ernst. Apparatus for collecting crops. 3,696,598, Cl. 56-364.000.
Weigert, Wolfgang: *See—*
Schreyer, Gerd; and Weigert, Wolfgang, 3,697,602.
Weigl, John W., to Xerox Corporation. Belt electrode imaging system. 3,697,409, Cl. 204-300.000.
Weil, Edward A.: *See—*
Atkinson, Roger F.; Parr, Richard H., Jr; and Weil, Edward A., 3,697,984.
Weil, Edward D., to Stauffer Chemical Company. Benzylation of triaryl phosphates. 3,697,628, Cl. 260-968.000.
Weinberg, Gerd: *See—*
Munk, Edmund; Haas, Herbert; and Weinberg, Gerd, 3,697,208.
Weiner, David William: *See—*
Greason, William Wallace, III; and Weiner, David William, 3,697,700.
Greason, William Wallace, III; and Weiner, David William, 3,697,701.
Weisker, Alexander; and Smith, Raymond L., Jr., to C & M Manufacturing Company, Inc., mesne. Side loading stacker. 3,696,954, Cl. 214-731.000.
Weldle, Helmut: *See—*
Seidel, Alex; Moller, Tilo; and Weldle, Helmut, 3,696,706.
Wells, George H.; and Persons, Perry B., to Technology Marketing Incorporated. Current driver system for a core memory. 3,697,966, Cl. 340-174.0tb.
Wells, Robert R., to Staco-Switch, Inc. Linear solenoid and inverter. 3,697,858, Cl. 321-18.000.
Wells, Rodney L.; Ulmer, Harry E.; and Mason, Paul J., to Allied Chemical Corporation. Substituted s-triazine formaldehyde adducts useful as herbicides. 3,697,249, Cl. 71-93.000.
Wenckus, Joseph F., to Little, Arthur D., Inc. Apparatus for growing crystals in plate form. 3,697,228, Cl. 23-273.00v.
Werner, Ervin R., Jr., to Du Pont de Nemours, E. I., and Company. Adhesion of fluoropolymer top coat. 3,697,309, Cl. 117-72.000.
Werner, Georg; and Kunst, Detlef, to Olympia Werke AG. Segment guide for typewriters and similar machines. 3,696,907, Cl. 197-41.000.
Werner, William J., to United States of America, Atomic Energy Commission. Fluxless aluminum brazing composition. 3,697,259, Cl. 75-134.00n.
Wernlund, Roger F., to Franklin Gno Corporation. Apparatus and methods for enhancing the detection of small-source plumes from moving aircraft. 3,697,749, Cl. 250-41.90d.
Wessells, Henry W., III. Torston Resistant open end automobile body. 3,697,124, Cl. 296-28.00r.
Wessling, Ritchie A.; and Settineri, William J., to Dow Chemical Company, The. Process for electrolytically applying polymer coatings on electroconductive articles. 3,697,398, Cl. 204-14.00n.
Western Electric Company, Incorporated: *See—*
Anderson, Aldin R.; Jennings, John D.; and Killerby, Walter E., 3,696,986.
Baldwin, Wiley M.; Fuchs, Edward O.; and Sharp, Donald J. (said Baldwin and said Sharp assors. to), 3,697,255.
Fuchs, Francis Joseph, Jr., 3,696,652.
Herring, Carl R.; and Schneider, Fred J., 3,696,985.
Jacisin, Joseph Michael; and Tropello, Sam Duane, 3,697,089.
Schjerven, William N., Jr., 3,696,928.
Westinghouse Electric Corporation: *See—*
Baker, Donal E., 3,697,860.
Berman, Paul A., 3,696,612.
Breed, Charles P.; and Anderson, Melvin R., 3,697,740.
Cooper, Herbert W., 3,697,997.
Eargle, William R., 3,697,743.

Fox, David A., 3,697,813.
Goldstein, Robert P.; and Agnew, Frank R., 3,697,227.
Heinrich, Theodore M.; Martin, Robert L.; and Steele, David J., 3,697,850.
Heymann, Frank J., 3,697,191.
Jones, William S.; and Hacker, Philip S., 3,697,993.
Kernick, Andress; and Ernstberger, Glenn W., 3,697,855.
Keto, August I.; and Farley, James R., 3,697,932.
Kilgore, Lee A.; and Demerdash, Nabeel A., 3,697,791.
Maniero, Daniel A.; and Wolf, Charles B., 3,697,612.
Mazur, Robert G., 3,697,873.
Sarkozi, Miklos; Szabo, Andras I.; and Hite, Perry J., 3,697,896.
Wilson, John I.; and Gary, Wardell, 3,697,810.

Weston Chemical Corporation: *See—*
Rattenbury, Kenneth; and Larrison, Millard S. (said Rattenbury assor. to), 3,697,627.

Weston, David. Flotation of copper and nickel sulfides from talcose bearing ores. 3,696,922, Cl. 209-5.000.

Weston Instruments, Inc.: *See—*
Luedeman, Robert T., 3,696,677.

Westvaco Corporation: *See—*
Falkehag, Sten I., 3,697,497.

Wetzig, John M., III: *See—*
Charman, Walter M., Jr.; Hayes, Robert R.; Middaugh, George J., Jr.; and Wetzig, John M., III, 3,697,631.

Wheelabrator-Frye Inc.: *See—*
Claeys, Ronald, 3,696,565.

Whirlpool Corporation: *See—*
Bunnell, Douglas E.; and Walker, Douglas J., 3,696,970.
Nystuen, Arne M., 3,697,841.

White, Albert: *See—*
Bryant, Clifford F., 3,696,530.

White Motor Corporation: *See—*
Rodgers, John J., 3,696,732.

Whitehead, Jack D., to International Products, Inc. Log lighter. 3,696,801, Cl. 126-92.00r.

Whitfield, Homer G., to Condeco Automation, Inc. Parts washer. 3,696,824, Cl. 134-6.200.

Whittaker Corporation: *See—*
Senter, Louis; and Johnson, Robert E., 3,696,689.

Whitty, Arthur R.: *See—*
Robbins, Robert; Whitty, Arthur R.; and Kachavos, Louis J., 3,697,876.

Widmer, Robert: *See—*
Meinhardt, Norman A.; and Widmer, Robert, 3,697,428.

Wieland, Roman G., to Tri W-G, Inc. Motorized parallel bar device manufactured in various lengths. 3,697,066, Cl. 272-63.000.

Wiese, Eugene Everett: *See—*
Berenson, Herman; Stonier, Robert Alden; and Wiese, Eugene Everett, 3,697,655.

Wiesenfeld, Arnold: *See—*
Mausner, Marvin L.; and Wiesenfeld, Arnold, 3,697,451.

Wiggershaus, Fred; and Donner, Klaus, to Demag Aktiengesellschaft. Blocking mechanism for an overhead crane trackway. 3,696,755, Cl. 104-250.000.

Wikner, Karl Gustav. Apparatus for packaging refuse and other materials. 3,696,737, Cl. 100-233.000.

Wilcox, Joseph C.: *See—*
Foltz, Thomas R.; Hegarty, Gerald R.; Hopkins, Ervin W.; and Wilcox, Joseph C., 3,696,662.

Wilcox, Milton E., to Motorola, Inc. Automatic gain control circuit. 3,697,883, Cl. 335-29.000.

Wilfert, Karl; and Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Safety steering for motor vehicles. 3,697,097, Cl. 280-87.00a.

Wilhelm Bleyle KG: *See—*
Merkle, Eberhardt, 3,696,764.

Wilkinson, Thomas B., III: *See—*
Reisman, Abraham J.; and Wilkinson, Thomas B., III, 3,697,365.

Will, Michael J. Stirring device. 3,697,053, Cl. 259-108.000.

Williams, Derek: *See—*
Waddan, Dhafir; and Williams, Derek, 3,697,534.

Williams, Kenneth Barnett, to International Business Machines Corporation. Card position sensing apparatus. 3,697,707, Cl. 200-46.000.

Williams, Lyle G.: *See—*
Harp, Richard D.; and Williams, Lyle G., 3,696,561.

Willing, David N.: *See—*
Polmanteer, Keith E.; Willing, David N.; and Talcott, Thomas D., 3,697,473.

Willis, William F. Double package. 3,696,991, Cl. 229-53.000.

Willitts, Clark M.: *See—*
Gallagher, John P.; Meyers, Robert M.; Sorg, Earl H.; and Willitts, Clark M., 3,697,472.

Wilsch, Herbert: *See—*
Ehgartner, Gabriele; and Wilsch, Herbert, 3,697,018.

Wilson, James A.: *See—*
Garabrant, Arthur R.; Beerbower, Alan; and Wilson, James A., 3,696,661.

Wilson, Joan L., to Goodyear Tire & Rubber Company, The. Amine salts of polyhydrosulfuric acids as shortstopping agents for emulsion polymerizations. 3,697,491, Cl. 260-82.300.

Wilson, John I.; and Gary, Wardell, to Westinghouse Electric Corporation. Electrical apparatus including interlocking circuit for ground fault sensor. 3,697,810, Cl. 317-18.00d.

Wilson, Jonathan W.: *See—*
Desjardins, Stanley P.; Canfield, Alan R.; and Wilson, Jonathan W., 3,696,999.

Wilson, Richard D.: *See—*
Pilipovich, Donald; and Wilson, Richard D., 3,697,394.

Winitz, Milton, to Morton-Norwich Products, Inc., mesne. Amino acid food composition. 3,697,287, Cl. 99-1.000.

Winsler, Robert J.; and Richter, Fred A., to Ardco, Inc. Mullion construction for refrigerator door frame. 3,697,723, Cl. 219-218.000.

Winter, Roland A. E., to Ciba-Geigy AG. Triazine carboxylic acids and esters. 3,697,520, Cl. 260-249.600.

Wisconsin Alumni Research Foundation: *See—*
De Luca, Hector F.; Schnoes, Heinrich K.; and Holick, Michael F., 3,697,559.
Reitan, Daniel K.; and Nagavarapu, Ramarao, 3,697,773.

Wiswell, James David: *See—*
Clack, Peter Joseph; Wiswell, James David; and Clemens, Anton Hubert, 3,697,730.

Wiszczor, Jan: *See—*
Paszke, Jan; Pstrocki, Henry; Ploszajski, Janusz; Lachman, Rudolf; Stanislaw, Lansy; and Wiszczor, Jan, 3,697,051.

Witco Chemical Corporation: *See—*
Mausner, Marvin L.; and Wiesenfeld, Arnold, 3,697,451.

Witkor, Dominik M., to Automatic Switch Company. Bypass and isolation switch. 3,697,709, Cl. 200-48.00r.

Wittich, Willibald: *See—*
Butter, Karl; and Wittich, Willibald, 3,697,405.

Wixon, Harold Eugene: *See—*
Sundby, Bjorn; and Wixon, Harold Eugene, 3,697,423.

Wolf, Charles B.: *See—*
Maniero, Daniel A.; and Wolf, Charles B., 3,697,612.

Wolofski, Nicholas, to Hoover Ball and Bearing Company. Seat back structure. 3,697,133, Cl. 297-460.000.

Wolverine Manufacturing Company, mesne: *See—*
Prins, Richard, Sr.; and Prins, Richard, Jr., 3,697,056.

Woodward, Fred E.: *See—*
Lichtman, Irwin A.; and Woodward, Fred E., 3,697,440.

Woodward, Robert B.: *See—*
Conover, Lloyd H.; and Woodward, Robert B., 3,697,552.

Woolf, Cyril: *See—*
Beyleveld, Wilhelmus M.; Oxenrider, Bryce C.; and Woolf, Cyril, 3,697,562.

Wrather, J. D., Jr, mesne: *See—*
Shade, Ross A.; and Terbrack, William H., 3,697,891.

Wrau, Norman J.: *See—*
Coyle, Roy M., Sr., 3,696,628.

Wright, Barry, Corporation: *See—*
Dean, Carl J., 3,696,935.

Wright, Donald A.: *See—*
Elder, James T.; and Wright, Donald A., 3,697,996.

Wszolek, Walter R.: *See—*
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,395.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,396.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,397.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,402.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,621.
Kehr, Clifton L.; and Wszolek, Walter R., 3,697,622.

Wu, Yao Hua; and Mueller, Arthur Jacob, to Mead Johnson & Company. 2-(3-Indolyl)-1(1-iminomethyl)-indolines and process for their preparation. 3,697,553, Cl. 260-326.110.

Wyche, Charlie: *See—*
McCawley, Frank X.; Wyche, Charlie; and Schlain, David, 3,697,390.

Wysocki, Joseph J., to Xerox Corporation. Electro-optic systems in which an electrophoretic-like or dipolar material is dispersed throughout a liquid crystal to reduce the turn-off time. 3,697,150, Cl. 350-150.000.

Xenon Corporation: *See—*
Dewey, Clarence Forbes, Jr., 3,697,889.

Xerox Corporation: *See—*
Adams, James E.; and Leder, Lewis B., 3,697,152.
Andrus, Paul G., 3,696,785.
Benson, Marshall, 3,696,784.
Bhagat, Gopal C.; and Randall, John M., 3,697,170.
Clark, Harold E., 3,697,160.
Fantuzzo, Joseph, 3,696,783.
Greenfield, Stephen J.; Howard, Anthony; and Knapp, Lowell W., 3,697,063.
Hamaker, Ralph A.; and Zucker, Edwin, 3,697,167.
Jordan, William E., 3,697,163.
La Cagnina, John M.; and Davies, Robert G., 3,697,407.
Lehmbeck, Donald R., 3,697,184.
Maksymiak, John; Beach, Kenneth M., Jr.; and Smith, James W., 3,697,169.
Mammino, Joseph, 3,697,263.
Severynse, Gerard T., 3,697,408.
Stanley, Michael R., 3,697,050.
Sullivan, William A., 3,697,171.
Teuscher, Leon A.; Trubisky, Michael P.; Palermiti, Frank M.; and Levine, Charles J., 3,697,265.
Weigl, John W., 3,697,409.
Wysocki, Joseph J., 3,697,150.

Yamabe, Shigeru; Shimizu, Masanao; and Yamamoto, Tadatsugu, to Dainippon Pharmaceutical Co., Ltd. 4-Nitropyrrole-2-carboxylic acid amide derivatives. 3,697,514, Cl. 260-240.00g.

Yamada, Tatsuya: *See—*

Honma, Tsutomu; Yamada, Tatsuya; Kawashima, Toshihide; Amano, Hideo; Mizuguchi, Mamoru; Inomata, Suekichi; Oguchi, Toshihiko; Nakano, Hiroshi; Nagata, Jiro; Takao, Shuji; Nishihar Takao; Sudo, Takao; and Tomita, Teiji, 3,696,717.

Yamada, Yasuo: *See—*
Nara, Kizo; Sukekawa, Izumi; and Yamada, Yasuo, 3,696,656.

Yamafuji, Kaoru: *See—*
Mitani, Masao; Aihara, Katzuzo; Kudo, Mitsuhiro; Hara, Nobuhiro; Irie, Fujio; and Yamafuji, Kaoru, 3,697,826.

Yamaguchi, Takeshi: *See—*
Kurihara, Osamu; Kuramoto, Naoya; Kamiyoshi, Masaya; and Yamaguchi, Takeshi, 3,697,310.

Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, to Sumitomo Chemical Company, Ltd. Process for preparing benzodiazocines and benzodiazonins. 3,697,508, Cl. 260-239.300.

Yamamoto, Manabu: *See—*
Morikawa, Takashi; Higake, Sotomatsu; Sumi, Mitsugu; Urifu, Tohoru; and Yamamoto, Manabu, 3,696,605.

Yamamoto, Masayuki; Toki, Hisashi; and Shibuya, Hideo, to Hitachi, Ltd. Semiconductor device for and method of manufacturing the same. 3,697,334, Cl. 148-33.300.

Yamamoto, Michihiro: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,697,508.

Yamamoto, Tadatsugu: *See—*
Yamabe, Shigeru; Shimizu, Masanao; and Yamamoto, Tadatsugu, 3,697,514.

Yamanouchi, Akira; Takenaka, Seisuke; and Mitori, Yukio, to Matsushita Kenko Kabushiki Kaisha. Method of making an enameled decorative board. 3,697,350, Cl. 156-245.000.

Yamashina, Hisao: *See—*
Iwai, Tadashi; Yamashina, Hisao; Takagi, Tetitsu; and Adachi, Shoichi, 3,697,386.

Yamashita, Yohachi: *See—*
Ichinose, Noboru; Egami, Harutoshi; Yokoyama, Katsunori; and Yamashita, Yohachi, 3,697,430.

Yanagidaira, Hidetaka: *See—*
Nakagome, Yukio; Kawai, Kazuo; Yanagidaira, Hidetaka; Shintain, Sotokichi; and Michishita, Isakichi, 3,697,881.

Yancey, LeRoy D.: *See—*
Reese, Frank P.; and Yancey, LeRoy D., 3,696,536.

Yarbrough, William R.: *See—*
Gunther, Gregory M.; Lewis, J. Stephen; Nishiguchi, Masakatsu; Robson, George E.; Wagner, Raymond P.; and Yarbrough, William R., 3,696,552.

Yarovsky, Lev Volfovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Yasuda, Kotaro: *See—*
Watanabe, Masami; Namikawa, Keishi; Yasuda, Kotaro; and Takagi, Motoyoshi, 3,697,605.

Yates, John S.: *See—*
Steele, Michael F.; and Yates, John S., 3,696,488.

Ydon, Lloyd E.: *See—*
Steigleder, Charles J.; Smithey, Linual D.; and Ydon, Lloyd E., 3,696,671.

Yeakley, Lester Marvin: *See—*
Dunham, Tom David; Yeakley, Lester Marvin; and Nagy, Andrew, 3,696,456.

Yerman, Alexander J.: *See—*
Orth, Edward D.; and Yerman, Alexander J., 3,697,917.
Orth, Edward D.; and Yerman, Alexander J., 3,697,918.

Yokoyama, Katsunori: *See—*
Ichinose, Noboru; Egami, Harutoshi; Yokoyama, Katsunori; and Yamashita, Yohachi, 3,697,430.

Yokozato, Junichi, to Zenza Bronica Kogyo Kabushiki Kaisha. Photographic apparatus with electrically operated focal plane shutter. 3,696,727, Cl. 95-57.000.

Yone, Harold R.: *See—*
Olson, Raymond E.; and Yone, Harold R., 3,696,602.

Yongue, James McIntire, to RCA Corporation. Mounting attachment for a modular substrate. 3,697,817, Cl. 317-101.0cc.

Yoo, Jin Sun; and Milam, Ronald L., to Atlantic Richfield Company. Oligomerization process. 3,697,617, Cl. 260-683.000.

Yoshino, Stanley Y., to United States of America, National Aeronautics and Space Administration. Bonding or repairing process. 3,697,630, Cl. 264-28.

Young, David W.; and Dieter, Jerry A., to Atlantic Richfield Company. Method of desuckering tobacco plants. 3,697,250, Cl. 71-78.000.

Young, Gary Clifford; and Kleinpeter, Joseph A., to Continental Oil Company. Adsorption process for recovering easy-to-regenerate condensible components from a multicomponent gas stream. 3,696,587, Cl. 55-62.000.

Young, Richard C.: *See—*
Elmore, Clifford L.; and Young, Richard C., 3,696,756.

Youtz, Donald E.; and Eigenbrode, Edwin M., to Teledyne Inc. Thread cutting die head. 3,696,454, Cl. 10-95.000.

Yssel, Gideon Petrus Schoeman. Mechanical headlamp adjusting means. 3,697,741, Cl. 240-7.100.

Yukutomi, Masuo: *See—*
Sassa, Atsuo; Yukutomi, Masuo; Shinkawa, Hirotoshi; Moriya, Tuneo; and Homma, Keisuke, 3,697,566.

Yurin Tokushu Kogyo Co.: *See—*
Narusawa, Shozo; and Iizuka, Noritoshi, 3,696,579.

Yurugi, Shojiro: *See—*
Imai, Yoshio; Matsumura, Haruki; Yurugi, Shojiro; and Miyake, Akio, 3,697,530.

Zacharias, Ellis M., Jr.; and Cirulis, Uldis, to Nusonics, Inc., mesne. Sound velocimeter. 3,697,936, Cl. 340-3.00e.

Zahradnik, George J., to Elco Corporation, mesne. Film cartridge for endless film. 3,697,009, Cl. 242-55.190.

Zalking Sewing Machine & Supply Co.: *See—*
Dunne, Owen F.; Hebert, William E.; Souza, Ronald; and Wargat, Edward, 3,696,770.

Zane, Ronald S. O.; and Mendell, Lester W., Jr. Artificial flowers having tiltably adjustable petals. 3,697,362, Cl. 161-30.000.

Zecher, Wilfried; and Merten, Rudolf, to Farbenfabriken Bayer Aktiengesellschaft. Preparation of polyamide-imide esters based on isocyanates, acid anhydrides and lactones. 3,697,484, Cl. 260-77.50r.

Zellstoffabrik Waldhof: *See—*
Schmidt, Robert Richard, 3,697,504.

Zenith Radio Corporation: *See—*
Dias, Fleming, 3,696,479.
Fleming, Dias, 3,697,899.

Zentner, Erich: *See—*
Andraschek, Hans-Joachim; and Zentner, Erich, 3,697,349.

Zenza Bronica Kogyo Kabushiki Kaisha: *See—*
Yokozato, Junichi, 3,696,727.

Zerna, Wolfgang; and Muhe, Ludwig, to Holzmann, Philipp, Aktiengesellschaft. Pressure container prestressed concrete or the like. 3,696,573, Cl. 52-224.000.

Zero Manufacturing Company: *See—*
Albright, Penrose Lucas, 3,696,790.

Zhelnov, Boris Stepanovich: *See—*
Chaikin, Boris Semenovich; Kozlov, Lev Ivanovich; Oblasti, Khimki Moskovskoi; Malchenko, Thomas Vasilievich; Mokrushin, Konstantin Dmitrievich; Yarovsky, Lev Volfovich; Maryanchik, Grigory Efimovich; Zhelnov, Boris Stepanovich; Tarasov, Vasily Mikhailovich Trubetskov, Kirill Mikhailvoch; Borschevsky, Igor Konstantinovich; and Chermensky, Dmitry Pavlovich, 3,697,058.

Ziegler, Earl E., to Dow Chemical Company, The. Hull construction for vessels and the like. 3,696,452, Cl. 9-6.000.

Zilius, Tadas, to Columbia Broadcasting System, Inc. Ball and cube with conduits extending between adjacent walls thereof. 3,696,549, Cl. 46-43.000.

Zimmermann, Horst: *See—*
Hartmann, Rudolf; and Zimmermann, Horst, 3,696,614.

Zink, John, Company: *See—*
Reed, Robert D., 3,697,231.

Zoecon Corporation: *See—*
Henrick, Clive A.; and Siddall, John B., 3,697,560.
Henrick, Clive A.; and Siddall, John B., 3,697,561.
Siddall, John B., 3,697,565.

Zolcon Corporation: *See—*
Siddall, John B., 3,697,549.

Zubkov, Vyacheslav Petrovich: *See—*
Stebakov, Emelyan Semenovich; Leontiev, Alexandr Ivanovich; Simpura, Petr Mikhailovich; Kozlov, Ivan Ivanovich; Glotov, Evgeny Borisovich; Musiyachenko, Alexandr Stepanovich; Antonov, Vladimir Alexandrovich; Vshivkov, Boris Alexandrovich; Podgorny, Sevantyn Ivanovich; Zubkov, Vyacheslav Petrovich; Milov, Vladimir Nikolaevich; Navrotsky, Nikolai Viktorovich; and Nikolsky, Leonid Alexandrovich, 3,697,038.

Zucker, Edwin: *See—*
Hamaker, Ralph A.; and Zucker, Edwin, 3,697,167.

Zuryk, John: *See—*
Lucas, Joseph G.; and Zuryk, John, 3,697,401.

Zycha, Harald, to Balzers Patent-und Beteiligungs-Aktiengesellschaft. Multilayer optical interference filter with wideband spectral transmission region and reduced ripple. 3,697,153, Cl. 350-166.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 10TH DAY OF OCTOBER, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Brizee, Mary J. W. Sensitizing dye combination containing symmetrical benzimidazolocarbocyanine dyes. T903,034, 10–10–72, Cl. 96—124.

Davis, Lee H., and D. R. Leonard. Waxing and polishing of surfaces by means of ablative waxing compositions. T903,031, 10–10–72, Cl. 401—96.

Du Pont de Nemours, E. I., and Co.: *See*—
Wang, David. T903,036.

Gunner, Leroy P. Hot-knife cutter for inner-tube splicer. T903,032, 10–10–72, Cl. 83—171.

Leonard, Don R.: *See*—
Davis, Lee H., and Leonard. T903,031.

McBrayer, Robert L. Bacteria-inhibiting urethane foams. T903,027, 10–10–72, Cl. 260—2.5.

Opperman, Chester W. X-ray film box having a monitoring radiation shield. T903,035, 10–10–72, Cl. 250—108.

Phillips, Bobby M. Process for producing texturized yarn. T903,028, 10–10–72, Cl. 57—140.

Phillips, Bobby M. Process for producing texturized yarn. T903,029, 10–10–72, Cl. 264—168.

Phillips, Bobby M. Process for producing texturized yarn. T903,030, 10–10–72, Cl. 57—140.

Selby, Donald W. Apparatus for recovering individual fibers from a bonded web or batt. T903,033, 10–10–72, Cl. 162—261.

Wang, David, to E. I. du Pont de Nemours and Co. Reinforced polymeric film. T903,036, 10–10–72, Cl. 260—41.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF OCTOBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

De Lessuex, Jacques B.: *See*—
Guillot, Jean Claude, Poignant, and De Lessuex. Re. 27,506.

Ditz-Crane: *See*—
Martin, Ottis M. Re. 27,502.

Ford Motor Co.: *See*—
Oster, Earl A., and T. H. Re. 27,508.

Gould, Irwin M., G. A. Moe, by Bell and Howell Co. Slide projector. Re. 27,503, 10–10–72, Cl. 353—21.

Grange, Raymond A., E. R. Shackelford, by United States Steel Corp., of Del., to United States Steel Corp. Method for producing ultrafine grained steel. Re. 27,505, 10–10–72, Cl. 148—43.

Guillot, Jean C., P. Poignant, and J. B. De Lessuex, to Pechiney-Saint-Gobain. Certain thiozolyluren compounds. Re. 27,506, 10–10–72, Cl. 260—306.

Martin, Ottis M., to Ditz-Crane. Shake strip assembly for roofing or siding. Re. 27,502, 10–10–72, Cl. 52—94.

Moe, Gerald A.: *See*—
Gould, Irwin M., and Moe. Re. 27,503.

Oster, Earl A. and T. H., to Ford Motor Co. Machine for disassembling components from composite products, Re. 27,508, 10–10–72, Cl. 241—186.

Oster, Thomas H.: *See*—
Oster, Earl A., and T. H. Re. 27,508.

Pechiney-Saint-Gobain: *See*—
Guillot, Jean C., Poignant, and De Lessuex. Re. 27,506.

Poignant, Pierre: *See*—
Guillot, Jean C., Poignant, and De Lessuex. Re. 27,506.

Shackelford, Edward R.: *See*—
Grange, Raymond A., and Shackelford. Re. 27,505.

Smith, Clarence J. Can opener. Re. 27,504, 10–10–72, Cl. 30—15.

Smoke-Ban Mfg. Inc.: *See*—
Turpin, Alexander J. Re. 27,507.

Turpin, Alexander J., to Smoke-Ban Mfg. Inc. Flare stack combustion tip. Re. 27,507, 10–10–72, Cl. 431—202.

United States Steel Corp.: *See*—
Grange, Raymond A., and Shackelford. Re. 27,505.

LIST OF DESIGN PATENTEES

American Telecommunications Corp.: *See*—
Perkins, George. 224,911.

Applied Power Industries, Inc.: *See*—
Houston, Robert W. 224,916.

Barr, E. Wallace, Jr. Restaurant building. 224,906, 10–10–72, Cl. D13—1.

Bennett, Arthur R. Adjustable ramp. 224,912, 10–10–72, Cl. D41—1.

Bombardier Ltd.: *See*—
Lapointe, Yves A., and MacKeen. 224,907.
MacKeen, Anthony D. 224,908.

Brassart, Patrick P. E. Bottle. 224,905, 10–10–72, Cl. D99—40.

Corning Glass Works: *See*—
Reagan, Richard D. 224,920.

Daniels, John F., and R. A. Mockovak, to Sperry Rand Corp. Carrying case insert. 224,921, 10–10–72, Cl. D87—1.

David, Andrew M. Jewelry pendant. 224,914, 10–10–72, Cl. D45—16.

Davis, Manuel J., and C. A. Nelson, to M-J Metal Products, Inc. Wall brace. 224,904, 10–10–72, Cl. D8—228.

Dreier, Raymond C. Hacksaw frame. 224,903, 10–10–72, Cl. D8—96.

Fichtel & Sachs AG: *See*—
Lannoch, Hans-Judgen. 224,922.

Fort Howard Paper Co.: *See*—
Rae, Ronald L. 224,917.
Rohde, Eugene L. 224,919.

Houston, Robert W., to Applied Power Industries, Inc. Tire inflation apparatus. 224,916, 10–10–72, Cl. D54—13.

Kenjiro, Goto. Cigarette lighter. 224,915, 10–10–72, Cl. D48—27.

Krause, Stephen R., ½% to Edward Stringer. Combined amplifier and speaker unit. 224,909, 10–10–72, Cl. D26—14.

Lannoch, Hans-Jurgen, to Fichtel & Sachs A.G. Gear shift housing for a bicycle. 224,922, 10–10–72, Cl. D90—1.

Lapointe, Yves A., and A. D. MacKeen, to Bombardier Ltd. Snowmobile sleigh. 224,907, 10–10–72, Cl. D14—24.

M-J Metal Products, Inc.: *See*—
Davis, Manuel J., and Nelson. 224,904.

MacKeen, Anthony D.: *See*—
Lapointe, Yves A., and MacKeen. 224,907.

MacKeen, Anthony D., to Bombardier Ltd. Snowmobile sleigh. 224,908, 10–10–72, Cl. D14—27.

Maroni, Carlo. Combined wristwatch and strap. 224,913, 10–10–72, Cl. D42—8.

Mockovak, Robert A.: *See*—
Daniels, John F., and Mockovak. 224,921.

Nelson, Carl A.: *See*—
Davis, Manuel J., and Nelson. 224,904.

Perkins, George, to American Telecommunications Corp. Desk telephone. 224,911, 10–10–72, Cl. D26—14.

Rae, Ronald L., to Fort Howard Paper Co. Paper toweling. 224,917, 10–10–72, Cl. D59—2.

Rae, Ronald L. Paper toweling. 224,918, 10–10–72, Cl. D59—2.

Reagan, Richard D., to Corning Glass Works. Broiler reflector or the like. 224,920, 10–10–72, Cl. D81—10.

Rickard, Robert E. Article holder. 224,902, 10–10–72, Cl. D8—71.

Rohde, Eugene L., to Fort Howard Paper Co. Paper toweling. 224,919, 10–10–72, Cl. D59—2.

St. Barth, Alaska. Combined adhesive magnetic-electric tape, ruler and acoustic coupling. 224,910, 10–10–72, Cl. D26—14.

Scaretti, Lorenzo. Buckle. 224,901, 10–10–72, Cl. D2—420.

Sperry Rand Corp.: *See*—
Daniels, John F., and Mockovak. 224,921.

Stringer, Edward: *See*—
Krause, Stephen R. 224,909.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 10, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
2.5 3,696,439
3A 3,696,440
3,696,441
8 3,696,442
114 3,696,443
222.4 3,696,444
243 3,696,445

CLASS 3
1 3,696,446

CLASS 4
3,696,447
3 3,696,448

CLASS 5
94 3,696,449
334 3,696,450

CLASS 8
10.2 3,697,215
111 3,697,217
115.5 3,697,218
127.6 3,697,219
142 3,697,220
460 3,697,216

CLASS 9
2A 3,696,451
6 3,696,452
14 3,696,453

CLASS 10
95 3,696,454

CLASS 12
145 3,696,455
146L 3,696,456

CLASS 13
17 3,697,660

CLASS 15
4 3,696,457
50C 3,696,458
104.92 3,696,459
229R 3,696,460

CLASS 16
16 3,696,461
49H 3,696,462
178 3,696,463

CLASS 17
11 3,696,464
48 3,696,465
71 3,696,466

CLASS 19
.37 3,696,467
255 3,696,468

CLASS 21
2.5 3,697,221
54A 3,697,222
83 3,697,223

CLASS 23
230R 3,697,224
253TP 3,697,225
3,697,227
254R 3,697,226
273V 3,697,228
277C 3,697,229
3,697,231
283 3,697,230
293R 3,697,233
312AH 3,697,234
346 3,697,235
358 3,697,232

CLASS 24
71J 3,696,469
90 3,696,470
193 3,696,471
205 3,696,472
205.1 3,696,473
266 3,696,474

CLASS 26
60 3,696,475

CLASS 28
17 3,696,476
44 3,696,477
72.1 3,696,478

CLASS 29
25.35 3,696,479
26A 3,696,480
33F 3,696,482
33T 3,696,481
90 3,696,483
105R 3,696,484
148.4C 3,696,485
182.5 3,696,486
191 3,697,236
3,697,237
191.2 3,697,238
200D 3,696,487
3,696,488
3,696,489
201 3,696,490
203H 3,696,492
203J 3,696,491
208B 3,696,493
213 3,696,494
240 3,696,495
260 3,696,496
407 3,696,497
424 3,696,498
476.5 3,696,499
487 3,696,500
509 3,696,501
527.4 3,696,503
527.7 3,696,502
558 3,696,504
592 3,696,505
604 3,696,506
611 3,696,507

CLASS 30
15.5 Re.27,504
43 3,696,508
90.6 3,696,509

CLASS 33
125R 3,696,511
141R 3,696,510
147D 3,696,512
174F 3,696,514
174L 3,696,513
192 3,696,515
245 3,696,516
265 3,696,517
357 3,696,518

CLASS 34
9 3,696,519
10 3,696,520
128 3,696,521
134 3,696,522
216 3,696,523

CLASS 35
9B 3,696,525
9C 3,696,524
9E 3,696,526
9R 3,696,527
3,696,528
26 3,696,529
28 3,696,530
31A 3,696,531
70 3,696,532
3,696,533

CLASS 36
2.5AL 3,696,534

CLASS 37
43C 3,696,535

CLASS 40
78.07 3,696,537
104.18 3,696,538
125E 3,696,539
126R 3,696,540
142 3,696,541
350 3,696,536

CLASS 42
16 3,696,542
67 3,696,543
74 3,696,544
170 3,696,546

CLASS 43
15 3,696,545
42.39 3,696,547

CLASS 44
3R 3,697,239
52 3,697,240

CLASS 46
25 3,696,548
43 3,696,549
77 3,696,550
3,696,822
116 3,696,553
135 3,696,551
3,696,552
201 3,696,554
202 3,696,555
220 3,696,556
243AV 3,696,558
243M 3,696,557

CLASS 47
9 3,696,559

CLASS 49
425 3,696,560
483 3,696,561

CLASS 51
165.88 3,696,562
320 3,696,565
332 3,696,563
356 3,696,564

CLASS 52
80 3,696,566
94 Re.27,502
98 3,696,567
108 3,696,568
122 3,696,569
127 3,696,570
144 3,696,571
173 3,696,572
224 3,696,573
236 3,696,574
287 3,696,575
583 3,696,577
618 3,696,578
747 3,696,576

CLASS 53
21R 3,696,579
27 3,696,580
35 3,696,581
59 3,696,582
124D 3,696,583
239 3,696,584
390 3,696,585
3,696,586

CLASS 55
62 3,696,587
163 3,696,588
233 3,696,589
238 3,696,590
337 3,696,591
500 3,696,592

CLASS 56
15.2 3,696,594
16.9 3,696,595
17.5 3,696,593
327 3,696,596
328TS 3,696,597
364 3,696,598

CLASS 57
1VN 3,696,599
5 3,696,600
34HS 3,696,601
34 Re.27,501
53 3,696,602
58.89 3,696,603
58.95 3,696,604
3,696,605

CLASS 58
58 3,696,606
85.5 3,696,607
90R 3,696,608
125R 3,696,609
145R 3,696,610

CLASS 60
23 3,696,611
39.14 3,696,612
52S 3,696,613
54.5R 3,696,614
54.6P 3,696,615
218 3,696,616
229 3,696,617
276 3,696,618
297 3,696,619
321 3,696,620

CLASS 61
36R 3,696,621
3,696,622
38 3,696,623
46 3,696,624
53.5 3,696,625

CLASS 62
6 3,696,626
51 3,696,627
115 3,696,628
129 3,696,629
188 3,696,630
282 3,696,631
285 3,696,632
294 3,696,633
333 3,696,634
344 3,696,635
399 3,696,636
402 3,696,637

CLASS 64
21 3,696,638
29 3,696,639

CLASS 65
2 3,697,241
30 3,697,242
273 3,697,243

CLASS 66
40 3,696,640
3,696,641

CLASS 68
5B 3,696,643
5D 3,696,642
15 3,696,644
177 3,696,645

CLASS 70
1.5 3,696,646
49 3,696,647
92 3,696,648
456R 3,696,649
457 3,696,650

CLASS 71
.1 3,697,244
28 3,697,245
34 3,697,246
3,697,247
38 3,697,248
78 3,697,250
93 3,697,249
94 3,697,251
95 3,697,252
97 3,697,253
122 3,697,254

CLASS 72
22 3,696,651
60 3,696,652
296 3,696,653
299 3,696,654
321 3,696,655
420 3,696,656
450 3,696,657
481 3,696,658

CLASS 73
4R 3,696,659
40.5R 3,696,660
54 3,696,661
81 3,696,662
91 3,696,663
99 3,696,664
104 3,696,665
118 3,696,666
143 3,696,667
146.8 3,696,668
168 3,696,669
170R 3,696,670
178R 3,696,671
189 3,696,672
194EM 3,696,674
194B 3,696,673
295 3,696,675
343R 3,696,676
3,696,677
346 3,696,678
358 3,696,679

CLASS 74
1.5 3,696,680
13 3,696,681
57 3,696,682
89 3,696,683
104 3,696,684
230.3 3,696,685
337.5 3,696,686
431 3,696,687
573 3,696,688
609 3,696,689
752E 3,696,690
797 3,696,691

CLASS 75
.5AB 3,697,255
40 3,697,256
64 3,697,257
128B 3,697,258
134N 3,697,259
139 3,697,260
208R 3,697,261
214 3,697,262

CLASS 76
112 3,696,692

CLASS 81
52.3 3,696,693
57.27 3,696,694

CLASS 82
1C 3,696,695
2.5 3,696,696

CLASS 83
649 3,696,697

CLASS 84
1.01 3,697,661
1.13 3,697,662
3,697,663
1.17 3,697,664
173 3,696,698
251 3,696,699
291 3,696,700

CLASS 85
28 3,696,701
77 3,696,702

CLASS 86
20C 3,696,703

CLASS 89
34 3,696,704
35A 3,696,705
196 3,696,706

CLASS 90
11C 3,696,707
3,696,708

CLASS 91
3 3,696,709
487 3,696,710

CLASS 92
48 3,696,711
52 3,696,712
121 3,696,713
170 3,696,714

CLASS 95
1R 3,696,715
1.1 3,696,716
4.5R 3,696,717
10CD 3,696,719
10C 3,696,718
3,696,720
11R 3,696,721
18R 3,696,722
31FM 3,696,723
44C 3,696,724
45 3,696,725
53EA 3,696,726
57 3,696,727
89 3,696,728

CLASS 96
1R 3,697,268
1.4 3,697,263
1.5 3,697,264
3,697,265
3,697,266
1.8 3,697,267
3 3,697,269
3,697,270
3,697,271
27 3,697,272
35.1 3,697,273
36.3 3,697,274
48R 3,697,275
48 3,697,276
50PL 3,697,277
67 3,697,278
77 3,697,279
90 3,697,280
108 3,697,281
139 3,697,282

CLASS 98
1 3,696,729
2.06 3,696,730
2.14 3,696,732
41 3,696,731

CLASS 99
1 3,697,283
3,697,287
2R 3,697,284
18 3,697,285
56 3,697,286
71 3,697,288
81 3,697,289
86 3,697,290
107 3,697,291
115 3,697,292
116 3,697,293
123 3,697,294
140R 3,697,295
307 3,696,733
331 3,696,734
404 3,696,735

CLASS 100
146 3,696,736
233 3,696,737

CLASS 101
38 3,696,738
93C 3,696,739
111 3,696,740
128.3 3,696,741
128.4 3,696,742
365 3,696,743
415.1 3,696,744
3,696,745
465 3,696,746

CLASS 102
10 3,696,747
38 3,696,748
49.7 3,696,749
67 3,696,750
3,696,751

CLASS 104
148LM 3,696,752
3,696,753
162 3,696,754
250 3,696,755
251 3,696,756

CLASS 105
4R 3,696,757
61 3,696,758
369A 3,696,759

CLASS 106
1 3,697,296
131 3,697,297
291 3,697,070

CLASS 108
32 3,696,760
53 3,696,761
134 3,696,762
157 3,696,763

CLASS 112
25 3,696,764
121.11 3,696,766
121.12 3,696,765
130 3,696,767
158R 3,696,768
159 3,696,769
252 3,696,770
417 3,696,771

CLASS 114
39 3,696,772
54 3,696,773
203 3,696,774

CLASS 116
67A 3,696,775
115.5 3,696,776

CLASS 117
2R 3,697,298
3 3,697,299
15 3,697,300

33.5C 3,697,301
34 3,697,302
37LE 3,697,303
37R 3,697,304
47A 3,697,305
3,697,306
56 3,697,307
65.2 3,697,308
72 3,697,309
3,697,311
76T 3,697,310
93.31 3,697,312
96 3,697,313
120 3,697,314
122P 3,697,315
130R 3,697,317
136 3,697,316
212 3,697,318
3,697,319
217 3,697,321
234 3,697,320
3,697,322
3,697,323

CLASS 118

5 3,696,777
9 3,696,778
48 3,696,779
69 3,696,780
425 3,696,781
637 3,696,782
3,696,783
3,696,784
3,696,785

CLASS 119

1 3,696,786
3,696,787
2 3,696,788
5 3,696,789
14.47 3,696,790
21 3,696,791
23 3,696,792

CLASS 122

4D 3,696,793
235R 3,696,794

CLASS 123

1A 3,696,795
8.01 3,696,796
8.09 3,696,797
32ST 3,696,798
136 3,696,799

CLASS 126

25A 3,696,800
92R 3,696,801
110B 3,696,802
276 3,696,803
285R 3,696,804

CLASS 127

2 3,697,324

CLASS 128

2F 3,696,806
2R 3,696,805
2.1B 3,696,808
2.1E 3,696,807
66 3,696,809
75 3,696,810
156 3,696,811
263 3,696,812
303.1 3,696,813
380 3,696,814

CLASS 130

27J 3,696,815

CLASS 131

133R 3,696,816
145 3,696,817

CLASS 132

9 3,696,818
33R 3,696,819
40 3,696,820
91 3,696,821
122 3,696,823

CLASS 134

6.2 3,696,824
167R 3,696,825

CLASS 135

45 3,696,826

CLASS 136

86A 3,697,326
86B 3,697,325
157 3,697,327
175 3,697,328
202 3,697,329

CLASS 137

79 3,696,827
81.5 3,696,828
183 3,696,829
209 3,696,830
246.12 3,696,831
512.1 3,696,832
559 3,696,833
596 3,696,834
625.25 3,696,836
625.33 3,696,837
625.38 3,696,838
625.6 3,696,835
625.61 3,696,839

CLASS 138

39 3,696,840
42 3,696,841

CLASS 139

57 3,696,842
125 3,696,843
186 3,696,844
383 3,696,845

CLASS 140

102 3,696,846

CLASS 146

42 3,696,847
83 3,696,848
146R 3,696,849

CLASS 148

1.5 3,697,330
6.15R 3,697,331
3,697,332
24 3,697,333
33.3 3,697,334
143 Re.27,505
154 3,697,335
171 3,697,336
175 3,697,337
188 3,697,338

CLASS 149

19 3,697,339
3,697,340
92 3,697,341

CLASS 150

33 3,696,850

CLASS 152

220 3,696,852
231 3,696,853
361 3,696,854

CLASS 156

13 3,697,342
3,697,343
72 3,697,344
155 3,697,345
161 3,697,346
181 3,697,347
190 3,697,348
219 3,697,349
245 3,697,350
272 3,697,351
3,697,352
310 3,697,353
319 3,697,355
380 3,697,354
467 3,697,356
510 3,697,357
514 3,697,358
518 3,697,359
551 3,697,360
558 3,697,361

CLASS 160

24 3,696,856
135 3,696,855
371 3,696,857

CLASS 161

30 3,697,362
44 3,697,363
59 3,697,364
133 3,697,365
159 3,697,366
168 3,697,367
227 3,697,368
250 3,697,369

CLASS 162

164 3,697,370
183 3,697,371

CLASS 164

49 3,696,858
52 3,696,859
73 3,696,860

CLASS 165

133 3,696,861
178 3,696,862
179 3,696,863

CLASS 166

.5 3,696,864
24B 3,696,866
64 3,696,865
276 3,696,867
315 3,696,868

CLASS 168

44 3,696,869

CLASS 171

17 3,696,870

CLASS 173

12 3,696,871
149 3,696,872

CLASS 174

1SC 3,697,665
52S 3,697,666
68C 3,697,667
68.5 3,697,668
84C 3,697,669
107 3,697,670
115 3,697,671

CLASS 175

20 3,696,873
122 3,696,874
329 3,696,875
374 3,696,876

CLASS 176

60 3,697,372
68 3,697,373
69 3,697,374
78 3,697,375
3,697,376
79 3,697,377

CLASS 178

3 3,697,672
5.4CD 3,697,673
5.4TE 3,697,674
5.4R 3,697,688
6.5 3,697,675
6.6DD 3,697,678
6.6A 3,697,679
6.6P 3,697,676
6.6R 3,697,677
6.8 3,697,680
3,697,681
3,697,682
7.1 3,697,683
7.2 3,697,684
7.3R 3,697,685
7.82 3,697,686
18 3,697,687
69.5R 3,697,689
3,697,690
94 3,697,691

CLASS 179

1SA 3,697,699
3,697,703
1G 3,697,692
2DP 3,697,693
2R 3,697,694
7MM 3,697,695
15BC 3,697,697
15BS 3,697,696
15A 3,697,698
18AB 3,697,700
18FA 3,697,701
18B 3,697,702
86 3,697,704
100.2C 3,697,705

CLASS 180

5R 3,696,877
9.46 3,696,878
9.48 3,696,879
77R 3,696,880
79.2R 3,696,881
98 3,696,882

CLASS 181

5BI 3,696,884
31B 3,696,885
3,696,886
36B 3,696,883

CLASS 182

28 3,696,887
35 3,696,888

CLASS 184

55A 3,696,889

CLASS 186

1 3,696,890

CLASS 188

1C 3,696,891
212 3,696,892
264E 3,696,893
275 3,696,894

CLASS 192

3R 3,696,895
3.28 3,696,896
4C 3,696,897
18A 3,696,898
58B 3,696,899
70 3,696,900
105BA 3,696,901
107C 3,696,902
136 3,696,903

CLASS 193

43R 3,696,904

CLASS 194

9 3,696,905

CLASS 195

31R 3,697,378
51R 3,697,379
80R 3,697,380

CLASS 197

18 3,696,906
41 3,696,907
98 3,696,908

CLASS 198

16 3,696,909
33AC 3,696,910
40 3,696,911
127 3,696,912
213 3,696,913

CLASS 200

5R 3,697,706
46 3,697,707
48R 3,697,709
61.21 3,697,708
61.41 3,697,710
67DB 3,697,711
146R 3,697,712
153J 3,697,713
172A 3,697,714

CLASS 201

40 3,697,381

CLASS 202

173 3,697,382
174 3,697,383

CLASS 203

1 3,697,384
11 3,697,385
48 3,697,386
72 3,697,387
96 3,697,388

CLASS 204

14N 3,697,398
15 3,697,399
37R 3,697,389
39 3,697,390
43 3,697,391
49 3,697,392
58 3,697,393
106 3,697,400
143R 3,697,401
157.1R 3,697,394
159.14 3,697,395
3,697,396
3,697,397
3,697,402
218 3,697,403
267 3,697,404
275 3,697,405
299 3,697,406
300 3,697,407
3,697,408
3,697,409
301 3,697,410
302 3,697,411

CLASS 206

1R 3,696,914
16BC 3,696,915
16.6 3,696,916
41F 3,696,917
45.31 3,696,918
47A 3,696,919
63.2R 3,696,920
73 3,696,921

CLASS 208

11 3,697,412
59 3,697,413
85 3,697,414
143 3,697,415
146 3,697,416

CLASS 209

5 3,696,922
12 3,696,923
73 3,696,924
109 3,696,925
122 3,696,926
211 3,696,927

CLASS 210

10 3,697,417
22 3,697,418
27 3,697,419
42 3,697,420
59 3,697,421
75 3,696,928
199 3,696,929
225 3,696,930
244 3,696,931
437 3,696,932
444 3,696,933
512 3,696,934

CLASS 211

13 3,696,935
41 3,696,936
54 3,696,937
78 3,696,938
117 3,696,939
126 3,696,940

CLASS 213

76 3,696,941

CLASS 214

1BB 3,696,942
1BC 3,696,943
2.5 3,696,944
6G 3,696,945
11R 3,696,946
14 3,696,947
16B 3,696,948
16.4A 3,696,949
17D 3,696,950
83.3 3,696,951
314 3,696,952
450 3,696,953
731 3,696,954

CLASS 215

9 3,696,955
40 3,696,956
41 3,696,957
56 3,696,958

CLASS 219

8.5 3,697,720
10.43 3,697,715
10.49 3,697,716
3,697,717
69S 3,697,719
136 3,697,721
216 3,697,722
218 3,697,723
219.062 3,697,718
241 3,697,724
388 3,697,725
469 3,697,726
532 3,697,727
548 3,697,728

CLASS 220

15 3,696,959
23.4 3,696,960
54 3,696,961
60R 3,696,962
3,696,963
85P 3,696,964
90.4 3,696,965
97F 3,696,966

CLASS 221

73 3,696,967
265 3,696,968

CLASS 222

105 3,696,969
145 3,696,970
183 3,696,971
189 3,696,972
193 3,696,973
251 3,696,974
333 3,696,975
504 3,696,976
561 3,696,977

CLASS 224

1B 3,696,978
42.1E 3,696,979

CLASS 225

66 3,696,980

CLASS 226

11 3,696,981
25 3,696,982
141 3,696,983

CLASS 227

110 3,696,984

CLASS 228

3 3,696,986
4 3,696,985

CLASS 229

1.5B 3,696,987
23R 3,696,988
34 3,696,989
37R 3,696,990
53 3,696,991

CLASS 232

4 3,696,992

CLASS 234

118 3,696,993

CLASS 235

60R 3,696,994
61.7B 3,697,729
92MT 3,697,730
139R 3,696,995
150.2 3,697,731
151.3 3,697,732
155 3,697,733
164 3,697,734
175 3,697,735

CLASS 236

92 3,696,996
102 3,696,997

CLASS 238

349 3,696,998

CLASS 239

265.35 3,696,999
407 3,697,000
521 3,697,001
535 3,697,002

CLASS 240

1.2 3,697,736
6.4B 3,697,737
7.1 3,697,741
10.6 3,697,738
17 3,697,739
46.37 3,697,740
78HA 3,697,742
147 3,697,743

CLASS 241

24 3,697,003
27 3,697,004
101M 3,697,005
171 3,697,006
186R Re.27,508

CLASS 242

18DD 3,697,007
43 3,697,008
55.19 3,697,009
56A 3,697,010
84.1A 3,697,011
84.51R 3,697,012
129.8 3,697,013
182 3,697,014
186 3,697,015
189 3,697,016
3,697,017
197 3,697,018

CLASS 244

1SB 3,697,021
3.29 3,697,019
12 3,697,020
17.13 3,697,022
153R 3,697,023

CLASS 246

169D 3,697,744
249 3,697,745
428 3,697,746
468 3,697,747

CLASS 248

15 3,697,024
27 3,697,025
46 3,697,026
68CB 3,697,027
101 3,697,030
121 3,697,028
171 3,697,031
188.4 3,697,032
188.8 3,697,029
226A 3,697,033
243 3,697,034
260 3,697,035

CLASS 249

74 3,697,036
81 3,697,037
137 3,697,038
219 3,697,039

CLASS 250

41.9TF 3,697,748
41.9D 3,697,749
43.5D 3,697,750
50 3,697,751
71.5R 3,697,752
71.5S 3,697,753
83.3 3,697,754
106S 3,697,755
106T 3,697,756
199 3,697,757
202 3,697,758
209 3,697,759
3,697,760
222R 3,697,761
239 3,697,762

CLASS 251

3 3,697,040
3,697,041
163 3,697,042
315 3,697,043

CLASS 252

8.1 3,697,422
8.55D 3,697,424
8.8 3,697,423
12 3,697,425
42.7 3,697,426
49.9 3,697,427
51.5A 3,696,851
56D 3,697,428
59 3,697,429
62.9 3,697,430
103 3,697,431
182 3,697,433
188.3 3,697,432
3,697,434
301.1R 3,697,436
301.1S 3,697,441
301.1 3,697,435
316 3,697,437
321 3,697,438
3,697,439
3,697,440
3,697,442
442 3,697,443
451 3,697,444
452 3,697,445
455Z 3,697,446
458 3,697,447
464 3,697,448
474 3,697,449
511 3,697,450
545 3,697,451
3,697,452
546 3,697,453

CLASS 254

45 3,697,044
51 3,697,045
111 3,697,046
141 3,697,047
148 3,697,048
187R 3,697,049

CLASS 259

4 3,697,050
3,697,051
8 3,697,052
108 3,697,053
154 3,697,054

CLASS 260

2A 3,697,496
2.5AJ 3,697,456
2.5AQ 3,697,458
2.5B 3,697,454
2.5F 3,697,457
2.5R 3,697,455
17.2 3,697,459
19U 3,697,461
21 3,697,462
23XA 3,697,463
27R 3,697,465
28.5AV 3,697,468
29.2M 3,697,469
29.6TA 3,697,466
3,697,467
29.7N 3,697,470
33.4R 3,697,471
33.8R 3,697,472
37SB 3,697,473
40R 3,697,474
41A 3,697,475
41R 3,697,476
46.5G 3,697,477
47CB 3,697,480
47CZ 3,697,478
47XA 3,697,481
47C 3,697,479
58 3,697,482
75NE 3,697,483
77.5AN 3,697,484
77.5NC 3,697,485
78SC 3,697,486
78.5R 3,697,618
79.1 3,697,487
79.7 3,697,488
80.7 3,697,489
80.76 3,697,490
82.3 3,697,491
85.5ES 3,697,492
85.5XA 3,697,493
86.7 3,697,494
91.3PV 3,697,495
124A 3,697,497
124R 3,697,498
139 3,697,499
154 3,697,500
163 3,697,501
209D 3,697,502
210R 3,697,503
211.5R 3,697,504
239B 3,697,505
239.1 3,697,506
3,697,507
239.3B 3,697,508
239.5 3,697,509
239.55R 3,697,510
3,697,511
240G 3,697,514
240R 3,697,512
3,697,513
243C 3,697,515
243R 3,697,516
244R 3,697,517
247.2B 3,697,460
248AS 3,697,518
249.6 3,697,520
249.7A 3,697,521
249.7P 3,697,519
250A 3,697,522
268SY 3,697,524
268TR 3,697,523
279R 3,697,464
281 3,697,525
3,697,526
293.81 3,697,529
294.8C 3,697,527
294.9 3,697,528
295AM 3,697,531
295R 3,697,530
295.5R 3,697,533
295.5T 3,697,532
296D 3,697,534
299 3,697,535
302R 3,697,536
306.7 3,697,537
306.8 Re.27,506
309 3,697,538
309.5 3,697,539
310R 3,697,540
326C 3,697,541
326.11 3,697,553
326.3 3,697,542
327E 3,697,543
328 3,697,544
333 3,697,545
340 3,697,546
343 3,697,547
343.2F 3,697,548
343.2R 3,697,549
346.8 3,697,550
349 3,697,551
351 3,697,552
377 3,697,554
397.2 3,697,559
397.45 3,697,556
3,697,557
397.5 3,697,558
397.6 3,697,555
399 3,697,560
3,697,561
404 3,697,563
404.5 3,697,562
408 3,697,564
3,697,565
429.7 3,697,566
437R 3,697,567
448.2B 3,697,569
448.8R 3,697,568
453PH 3,697,570
453R 3,697,571
3,697,572
457 3,697,573
462R 3,697,574
3,697,575
465E 3,697,596
465.3 3,697,576
465.4 3,697,577
465.9 3,697,578
468R 3,697,579
3,697,580
479R 3,697,581
482C 3,697,582
486R 3,697,583
3,697,584
488B 3,697,585
497A 3,697,586
501.19 3,697,587
514R 3,697,588
518R 3,697,589
3,697,590
525 3,697,591
562R 3,697,592
563P 3,697,593
563R 3,697,594
566A 3,697,597
566R 3,697,595
584 3,697,598
591 3,697,599
593R 3,697,600
609F 3,697,601
609R 3,697,602
614A 3,697,603
618F 3,697,604
618H 3,697,605
620 3,697,606
648C 3,697,607
653.5 3,697,608
655 3,697,609
664 3,697,610
677XA 3,697,611
679R 3,697,612
683D 3,697,613
683.15D 3,697,617
683.2 3,697,616
683.3 3,697,614
683.9 3,697,615
836 3,697,619
3,697,620
858 3,697,621
3,697,622
859R 3,697,623
860 3,697,624
869 3,697,625
926 3,697,626
928 3,697,627
968 3,697,628

CLASS 263

8R 3,697,055
3,697,056
29 3,697,057

CLASS 264

1 3,697,629
28 3,697,630
37 3,697,631
40 3,697,632
45 3,697,633
109 3,697,634
135 3,697,635
147 3,697,636
168 3,697,637
293 3,697,657

CLASS 266

34L 3,697,058

CLASS 267

161 3,697,059

CLASS 269

228 3,697,060

CLASS 270

5 3,697,061
30 3,697,062

CLASS 271

4 3,697,063
5 3,697,064

CLASS 272

59R 3,697,065
63 3,697,066
66 3,697,067

CLASS 273

29A 3,697,068
72 3,697,069
86D 3,697,071
87H 3,697,072
95R 3,697,073
96R 3,697,074
110 3,697,075
131A 3,697,076
135B 3,697,077
136G 3,697,078
179A 3,697,079
186R 3,697,080
199A 3,697,081
205 3,697,082

CLASS 274

4B 3,697,085
4F 3,697,083
3,697,084
17 3,697,086
23R 3,697,087

CLASS 277

9 3,697,088
35 3,697,089
157 3,697,090
235A 3,697,091

CLASS 279

4 3,697,092

CLASS 280

5A 3,697,093
11.35T 3,697,094
47.26 3,697,095
47.32 3,697,096
87A 3,697,097
415R 3,697,098
446B 3,697,099

CLASS 281

42 3,697,100

CLASS 283

62 3,697,101

CLASS 285

340 3,697,102

CLASS 287

58CT 3,697,103
111 3,697,104

CLASS 290

17 3,697,763
42 3,697,764
54 3,697,765

CLASS 292

175 3,697,106
216 3,697,105
337 3,697,107

CLASS 293

89 3,697,108

CLASS 294

1CA 3,697,109
57 3,697,110
64 3,697,111
65 3,697,112
86.24 3,697,113
86.26 3,697,114
88 3,697,115
103 3,697,116
106 3,697,117
110R 3,697,118

CLASS 295

36R 3,697,119

CLASS 296

1S 3,697,120
23R 3,697,121
3,697,122
24 3,697,123
28R 3,697,124
97C 3,697,125
137A 3,697,126

CLASS 297

182 3,697,127
216 3,697,128
217 3,697,129
248 3,697,130
258 3,697,131
269 3,697,132
460 3,697,133

CLASS 299

8 3,697,134
39 3,697,135
83 3,697,136
86 3,697,137

CLASS 303

6C 3,697,138
21P 3,697,139

CLASS 307

10R 3,697,767
31 3,697,768
41 3,697,769
93 3,697,773
136 3,697,774
141.4 3,697,770
154 3,697,771
209 3,697,775
219 3,697,776
228 3,697,777
229 3,697,778
235 3,697,779
3,697,780
3,697,781
3,697,782
244 3,697,772
300 3,697,783
303 3,697,784
3,697,785
304 3,697,786
308 3,697,787

CLASS 308

3.8 3,697,140
4A 3,697,141
5 3,697,142
10 3,697,143
15 3,697,144
72 3,697,145

CLASS 310

8.2 3,697,766
8.3 3,697,790
9.5 3,697,788
3,697,789
111 3,697,791
234 3,697,792

CLASS 312

39 3,697,146
111 3,697,147
268 3,697,148

CLASS 313

63 3,697,793
94 3,697,794
102 3,697,795
134 3,697,796
217 3,697,797
330 3,697,798

CLASS 315

3.5 3,697,799
27TD 3,697,801
27R 3,697,800
65 3,697,802
82 3,697,803
105 3,697,804
241P 3,697,805

CLASS 317

2F 3,697,806
16 3,697,807
18A 3,697,808
18C 3,697,809
18D 3,697,810
27R 3,697,811
36TD 3,697,813
100 3,697,814
3,697,815
101CC 3,697,816
3,697,817
101CW 3,697,818
103 3,697,819
148.5B 3,697,820
3,697,821
230 3,697,822
3,697,823
3,697,824
234R 3,697,825
3,697,826
235R 3,697,828
3,697,829
3,697,830
3,697,831
3,697,832
3,697,833
235 3,697,827
237 3,697,834
246 3,697,835
262A 3,697,836
335C 3,697,812

CLASS 318

128 3,697,837
135 3,697,838
138 3,697,839
3,697,840
207A 3,697,841
221R 3,697,842
227 3,697,843
331 3,697,844
341 3,697,845
544 3,697,846
608 3,697,847
649 3,697,848
674 3,697,849

CLASS 320

39 3,697,850

CLASS 321

2 3,697,851
3,697,852
3,697,853
3,697,854
9A 3,697,855
10 3,697,856
18 3,697,858
20 3,697,857

CLASS 322

28 3,697,859

CLASS 323

9 3,697,860
3,697,861
3,697,862
20 3,697,863

CLASS 324

10 3,697,864
16R 3,697,865
34R 3,697,866
40 3,697,867
3,697,868
43R 3,697,869
3,697,870
99R 3,697,871
142 3,697,872
158D 3,697,873

CLASS 325

38A 3,697,874
65 3,697,875
67 3,697,876

CLASS 328

13 3,697,877
17 3,697,878
61 3,697,879
123 3,697,880

CLASS 329

104 3,697,881

CLASS 330

15 3,697,882
29 3,697,883

CLASS 331

1A 3,697,884
8 3,697,885
69 3,697,886
94.5 3,697,887
3,697,888
3,697,889
116 3,697,890

CLASS 332

9R 3,697,892
9T 3,697,891
16R 3,697,893

CLASS 333

7 3,697,894
8 3,697,895
12 3,697,896
18 3,697,897
21A 3,697,898
30 3,697,899
31A 3,698,008
72 3,697,903
80 3,697,900
84M 3,697,901
3,697,902

CLASS 334

51 3,697,904

CLASS 335

1 3,697,905
58 3,697,906
201 3,697,907
209 3,697,908
210 3,697,909
296 3,697,910

CLASS 336

62 3,697,914
84 3,697,911
133 3,697,912
205 3,697,913

CLASS 337

74 3,697,915
161 3,697,916

CLASS 338

2 3,697,917
3 3,697,918
42 3,697,919
121 3,697,920
131 3,697,921
163 3,697,922
280 3,697,923

CLASS 339

14R 3,697,924
17F 3,697,925
17L 3,697,926
19 3,697,927
45M 3,697,928
75MP 3,697,929
89C 3,697,930
95R 3,697,931
111 3,697,932
192R 3,697,933
217S 3,697,934
3,697,935

CLASS 340

3E 3,697,936
15.5CP 3,698,009
15.5TA 3,697,938
15.5TD 3,697,939
15.5A 3,697,937
18R 3,697,940
23 3,697,941
52C 3,697,942
52D 3,697,943
58 3,697,944
64 3,697,945
82 3,697,946
146.1AL 3,697,948
3,697,949
146.1AQ 3,697,947
3,697,950
146.3Q 3,697,951
147R 3,697,952
163R 3,697,953
166R 3,697,954
172.5 3,697,955
3,697,956
3,697,957
3,697,958
3,697,959
3,697,960
3,697,961
173R 3,697,962
174CA 3,697,967
174DC 3,698,011
174PC 3,697,964
174TB 3,697,966
174TF 3,697,963
174YC 3,698,010
174.1A 3,697,969
174.1E 3,697,965
174.1R 3,697,968
183 3,697,970
258C 3,697,971
258R 3,697,972
261 3,697,973
275 3,697,974
310 3,697,975
324A 3,697,976
324R 3,698,012
347AD 3,697,978
347DA 3,697,979
3,697,980
347DD 3,697,977
359 3,697,981
384E 3,697,982
3,697,983
408 3,697,984

CLASS 343

5EM 3,697,987
5PD 3,697,985
3,697,989
5R 3,697,986
3,697,988
6R 3,697,990
6.5LC 3,697,991
7ED 3,697,992
7.5 3,698,013
7.7 3,697,993
16R 3,697,994
100SA 3,697,995
101 3,697,996
108R 3,697,997
754 3,697,998
763 3,697,999
772 3,698,000
909 3,698,001

CLASS 346

1 3,698,002
17 3,698,003
23 3,698,004
74ES 3,698,006
74MT 3,698,005

CLASS 350

3.5 3,697,149
150 3,697,150
151 3,697,151
158 3,697,152
166 3,697,153
174 3,697,154
184 3,697,155
298 3,697,156
302 3,697,157

CLASS 352

17 3,697,158
128 3,697,159

CLASS 353

21 Re.27,503
117 3,697,161
120 3,697,162

CLASS 355

3 3,697,160

	3,697,163
4	3,697,164
8	3,697,165
	3,697,166
	3,697,167
12	3,697,168
14	3,697,169
17	3,697,170
	3,697,171
	3,697,172
27	3,697,173
38	3,697,174
39	3,697,175
45	3,697,176
67	3,697,177
77	3,697,178
CLASS 356	
73	3,697,179
75	3,697,180
106LR	3,697,181
112	3,697,182
114	3,697,183
175	3,697,184
181	3,697,185
CLASS 408	
142	3,697,186
154	3,697,187
230	3,697,188
CLASS 415	
36	3,697,189
73	3,697,190
168	3,697,191
CLASS 416	
96	3,697,192
223	3,697,193
CLASS 417	
54	3,697,194
154	3,697,195
211	3,697,196
360	3,697,197
411	3,697,198
498	3,697,199
CLASS 418	
61	3,697,200
132	3,697,201
142	3,697,202
173	3,697,203
CLASS 424	
1	3,697,638
12	3,697,639
35	3,697,640
38	3,697,641
59	3,697,642
63	3,697,643
70	3,697,644
85	3,697,645
117	3,697,646
118	3,697,647
	3,697,648
120	3,697,649
122	3,697,650
128	3,697,651
180	3,697,652
184	3,697,653
204	3,697,655
270	3,697,656
324	3,697,658
325	3,697,659
330	3,697,654
CLASS 425	
4	3,697,205
20	3,697,206
63	3,697,207
109	3,697,209
147GA	3,697,208
168	3,697,210
191DM	3,697,211
400CR	3,697,204
450	3,697,212
CLASS 431	
79	3,697,213
168	3,697,214
202	Re.27,507
CLASS 444	
1	3,698,007

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,696,733
3,697,049
3,697,247
2 : 3,697,395
3 : 3,697,854
4 : 3,696,459
3,696,698
3,696,731
3,696,805
3,696,895
3,696,987
3,697,111
3,697,629
3,697,685
3,697,708
3,697,837
3,697,853
3,697,883
5 : 3,696,803
3,697,245
6 : Re.27,502
3,696,439
3,696,453
3,696,479
3,696,488
3,696,510
3,696,531
3,696,537
3,696,540
3,696,546
3,696,552
3,696,553
3,696,555
3,696,559
3,696,563
3,696,570
3,696,584
3,696,616
3,696,617
3,696,628
3,696,630
3,696,633
3,696,659
3,696,670
3,696,671
3,696,686
3,696,689
3,696,702
3,696,720
3,696,739
3,696,758
3,696,759
3,696,773
3,696,787
3,696,791
3,696,795
3,696,801
3,696,814
3,696,826
3,696,855
3,696,864
3,696,874
3,696,883
3,696,888
3,696,891
3,696,901
3,696,921
3,696,947
3,696,953
3,696,959
3,696,964
3,696,965
3,696,975
3,696,978
3,696,984
3,696,991
3,696,995
3,697,005
3,697,017
3,697,027
3,697,031
3,697,040
3,697,047
3,697,067
3,697,096
3,697,127
3,697,135
3,697,143
3,697,149
3,697,164
3,697,183
3,697,194
3,697,203
3,697,205
3,697,217
3,697,241
3,697,244
3,697,287
3,697,289
3,697,308
3,697,320
3,697,322
3,697,345
3,697,362
3,697,376
3,697,394
3,697,404
3,697,410
3,697,418
3,697,422
3,697,424
3,697,426
3,697,431
3,697,434
3,697,535
3,697,536
3,697,538
3,697,549
3,697,552
3,697,560
3,697,561
3,697,565
3,697,567
3,697,571
3,697,572
3,697,573
3,697,582
3,697,595
3,697,600
3,697,611
3,697,630
3,697,633
3,697,634
3,697,661
3,697,666
3,697,673
3,697,675
3,697,678
3,697,679
3,697,680
3,697,687
3,697,689
3,697,705
3,697,720
3,697,735
3,697,739
3,697,742
3,697,755
3,697,763
3,697,772
3,697,775
3,697,793
3,697,796
3,697,799
3,697,805
3,697,820
3,697,847
3,697,856
3,697,858
3,697,864
3,697,887
3,697,891
3,697,894
3,697,895
3,697,899
3,697,907
3,697,920
3,697,931
3,697,947
3,697,950
3,697,960
3,697,965
3,697,966
3,697,968
3,697,971
3,697,975
3,697,994
3,697,995
3,698,008
7 : 3,696,760
8 : 3,696,511
3,696,657
3,696,782
3,697,161
3,697,324
3,697,642
3,697,700
3,697,701
3,697,836
3,697,851
3,698,004
9 : 3,696,483
3,696,485
3,696,524
3,696,543
3,696,589
3,696,699
3,696,708
3,696,749
3,696,813
3,696,818
3,696,908
3,696,952
3,696,954
3,696,958
3,696,969
3,697,020
3,697,151
3,697,165
3,697,192
3,697,229
3,697,346
3,697,353
3,697,357
3,697,370
3,697,400
3,697,401
3,697,432
3,697,453
3,697,456
3,697,506
3,697,570
3,697,591
3,697,715
3,697,753
3,697,795
3,697,949
3,697,956
3,697,972
10 : 3,696,772
3,697,123
3,697,126
3,697,191
3,697,280
3,697,296
3,697,307
3,697,347
3,697,449
3,697,468
3,697,551
3,697,586
3,697,594
3,698,005
11 : 3,696,747
3,697,057
12 : Re.27,504
3,696,572
3,696,596
3,696,599
3,696,631
3,696,694
3,696,700
3,696,745
3,696,788
3,696,792
3,696,943
3,697,021
3,697,109
3,697,157
3,697,196
3,697,220
3,697,363
3,697,478
3,697,486
3,697,693
3,697,733
3,697,748
3,697,749
3,697,765
3,697,924
3,697,980
3,697,998
13 : Re.27,501
3,696,466
3,697,013
3,697,026
3,697,474
3,697,475
3,697,607
3,697,974
17 : Re.27,503
3,696,442
3,696,443
3,696,462
3,696,477
3,696,503
3,696,548
3,696,557
3,696,591
3,696,595
3,696,602
3,696,618
3,696,639
3,696,647
3,696,662
3,696,669
3,696,711
3,696,724
3,696,729
3,696,734
3,696,741
3,696,744
3,696,834
3,696,837
3,696,863
3,696,878
3,696,890

3,696,905
3,696,917
3,696,928
3,696,961
3,696,989
3,697,004
3,697,009
3,697,033
3,697,034
3,697,035
3,697,046
3,697,053
3,697,074
3,697,079
3,697,086
3,697,105
3,697,140
3,697,158
3,697,162
3,697,177
3,697,200
3,697,224
3,697,236
3,697,264
3,697,283
3,697,311
3,697,411
3,697,413
3,697,416
3,697,446
3,697,467
3,697,494
3,697,509
3,697,547
3,697,574
3,697,616
3,697,617
3,697,626
3,697,644
3,697,651
3,697,681
3,697,712
3,697,725
3,697,738
3,697,758
3,697,774
3,697,779
3,697,788
3,697,808
3,697,859
3,697,926
3,697,929
3,697,953
3,698,002

18 : 3,696,496
3,696,528
3,696,544
3,696,565
3,696,780
3,696,856
3,697,090
3,697,098
3,697,121
3,697,139
3,697,388
3,697,481
3,697,482
3,697,548
3,697,553
3,697,558
3,697,613
3,697,686
3,697,727
3,697,730
3,697,800
3,697,814
3,697,817
3,697,824
3,697,828
3,697,842
3,697,886
3,697,909

19 : 3,696,493
3,696,976
3,696,996
3,697,861

20 : 3,696,451
3,696,509
3,696,778
3,696,870
3,696,939
3,697,159

21 : 3,696,491
3,696,514
3,696,515
3,696,592
3,696,754
3,697,723

22 : 3,696,600
3,696,603
3,696,789
3,696,865
3,696,869
3,697,316

23 : 3,697,360
3,697,790

24 : 3,696,465
3,696,474
3,696,495
3,696,504
3,696,561
3,696,568
3,696,578
3,696,746
3,696,848
3,697,019
3,697,182
3,697,198
3,697,340
3,697,341
3,697,373
3,697,390
3,697,396
3,697,397
3,697,402
3,697,425
3,697,476
3,697,621
3,697,622
3,697,645
3,697,831
3,697,890
3,697,898
3,697,941
3,697,990
3,697,993
3,697,997

25 : 3,696,455
3,696,471
3,696,487
3,696,499
3,696,522
3,696,564
3,696,672
3,696,684
3,696,716
3,696,812
3,696,846
3,696,924
3,696,935
3,696,942
3,696,956
3,696,986
3,697,014
3,697,023
3,697,175
3,697,176
3,697,204
3,697,226
3,697,228
3,697,232
3,697,238
3,697,248
3,697,267
3,697,269
3,697,270
3,697,271
3,697,279
3,697,330
3,697,380
3,697,383
3,697,457
3,697,466
3,697,683
3,697,691
3,697,703
3,697,771
3,697,783
3,697,797
3,697,822
3,697,827
3,697,830
3,697,889
3,697,915
3,697,917
3,697,918
3,697,919
3,697,955
3,697,992
3,698,007

26 : Re.27,508
3,696,440
3,696,441
3,696,452
3,696,490
3,696,497
3,696,513
3,696,518
3,696,535
3,696,541
3,696,582
3,696,611
3,696,613
3,696,615
3,696,620
3,696,753
3,696,771
3,696,798
3,696,824
3,696,836
3,696,857
3,696,873
3,696,893
3,696,896
3,696,898
3,696,904
3,696,938
3,696,945
3,696,970
3,696,980
3,697,001
3,697,052
3,697,056
3,697,060
3,697,070
3,697,088
3,697,092
3,697,102
3,697,106
3,697,108
3,697,130
3,697,133
3,697,147
3,697,186
3,697,202
3,697,211
3,697,262
3,697,312
3,697,351
3,697,391
3,697,392
3,697,398
3,697,403
3,697,473
3,697,477
3,697,483
3,697,503
3,697,524
3,697,537
3,697,557
3,697,719
3,697,731
3,697,782
3,697,839
3,697,840
3,697,841
3,697,865
3,697,930
3,697,942
3,697,977
3,697,985
3,698,006

27 : 3,696,580
3,696,593
3,696,666
3,696,715
3,696,852
3,697,011
3,697,197
3,697,358
3,697,420
3,697,485
3,697,516
3,697,726
3,697,804
3,697,951
3,697,996
3,698,010

28 : 3,696,560
3,697,100
3,697,743

29 : 3,696,501
3,696,527
3,696,825
3,696,916
3,696,968
3,697,077
3,697,091
3,697,138
3,697,221
3,697,252
3,697,284
3,697,421
3,697,659

31 : 3,696,799
3,697,132
3,697,674

32 : 3,697,039
3,697,698

33 : 3,697,000
3,697,815
3,697,876
3,697,877
3,697,911
3,697,916
3,697,983

34 : 3,696,494
3,696,506
3,696,521
3,696,549
3,696,550
3,696,581
3,696,588
3,696,590
3,696,629
3,696,649
3,696,652
3,696,661
3,696,677
3,696,683
3,696,709
3,696,740
3,696,748
3,696,796
3,696,811
3,696,885
3,696,900
3,696,915
3,696,931
3,696,940
3,696,960
3,696,971
3,697,002
3,697,016
3,697,043
3,697,045
3,697,089
3,697,178
3,697,189
3,697,210
3,697,234
3,697,253
3,697,300
3,697,319
3,697,336
3,697,368
3,697,414
3,697,423
3,697,429
3,697,440
3,697,445
3,697,451
3,697,452
3,697,455
3,697,462
3,697,464
3,697,472
3,697,499
3,697,533
3,697,542
3,697,545
3,697,562
3,697,564
3,697,584
3,697,585
3,697,587
3,697,592
3,697,604
3,697,606
3,697,618
3,697,620
3,697,624
3,697,638
3,697,643
3,697,649
3,697,655
3,697,658
3,697,669
3,697,682
3,697,690
3,697,709
3,697,714
3,697,754
3,697,757
3,697,777
3,697,802
3,697,834
3,697,862
3,697,885
3,697,888
3,697,892
3,697,897
3,697,906
3,697,936
3,697,959
3,697,963
3,697,964
3,697,978
3,697,988
3,698,000

35 : 3,696,750
3,696,751

36 : 3,696,457
3,696,461
3,696,469
3,696,472
3,696,486
3,696,500
3,696,526
3,696,538
3,696,551
3,696,585
3,696,621
3,696,626
3,696,646
3,696,654
3,696,667
3,696,675
3,696,713
3,696,722
3,696,723
3,696,726
3,696,783
3,696,784
3,696,797
3,696,802
3,696,808
3,696,847
3,696,850
3,696,892
3,696,918
3,696,919
3,696,929
3,696,932
3,696,933
3,696,937
3,696,941
3,696,973
3,696,981
3,697,012
3,697,036
3,697,050
3,697,061
3,697,063
3,697,075
3,697,082
3,697,095
3,697,125
3,697,129
3,697,150
3,697,152
3,697,154
3,697,155
3,697,160
3,697,163
3,697,167
3,697,168
3,697,169
3,697,170
3,697,171
3,697,174
3,697,181
3,697,184
3,697,185
3,697,195
3,697,258
3,697,263
3,697,265
3,697,281
3,697,290
3,697,292
3,697,301
3,697,306
3,697,318
3,697,331
3,697,342
3,697,343
3,697,354
3,697,366
3,697,369
3,697,407
3,697,408
3,697,409
3,697,447
3,697,459
3,697,489
3,697,495
3,697,505
3,697,512
3,697,520
3,697,531
3,697,608
3,697,628
3,697,639

37 : 3,696,444
3,696,476
3,696,763
3,696,810
3,696,822
3,696,889
3,697,007
3,697,025
3,697,188
3,697,255
3,697,299
3,697,479
3,697,492
3,697,961

38 : 3,697,066
3,697,099

39 : 3,696,450
3,696,460
3,696,480
3,696,484
3,696,530
3,696,632
3,696,635
3,696,655
3,696,678
3,696,679
3,696,680
3,696,732
3,696,742
3,696,756
3,696,785
3,696,786
3,696,800
3,696,807
3,696,829
3,696,835
3,696,886
3,696,966
3,696,997
3,697,003
3,697,006
3,697,008
3,697,029
3,697,054
3,697,107
3,697,110
3,697,117
3,697,137
3,697,235
3,697,242
3,697,256
3,697,257
3,697,272
3,697,276
3,697,288
3,697,297
3,697,313
3,697,323
3,697,356
3,697,364
3,697,371
3,697,428
3,697,435
3,697,437
3,697,490
3,697,491
3,697,631
3,697,668
3,697,706
3,697,813
3,697,843
3,697,855
3,697,860
3,697,903
3,697,910
3,697,923
3,697,945
3,698,011

40 : 3,696,575
3,696,587
3,696,695
3,696,944
3,697,231
3,697,233
3,697,277
3,697,384
3,697,448
3,697,487
3,697,615
3,697,654
3,697,670
3,697,750
3,697,780
3,697,884

41 : 3,696,668
3,696,692
3,696,925
3,697,115
3,697,355
3,697,778
3,697,785

42 : Re.27,505
Re.27,507
3,696,448
3,696,454
3,696,467
3,696,470
3,696,489
3,696,507
3,696,532
3,696,554
3,696,594
3,696,601
3,696,612

3,696,627
3,696,637
3,696,648
3,696,665
3,696,687
3,696,693
3,696,697
3,696,712
3,696,728
3,696,738
3,696,815
3,696,831
3,696,838
3,696,840
3,696,859
3,696,899
3,696,912
3,696,923
3,696,936
3,696,946
3,696,967
3,696,985
3,696,988
3,697,030
3,697,042
3,697,069
3,697,124
3,697,131
3,697,134
3,697,136
3,697,190
3,697,227
3,697,260
3,697,285
3,697,298
3,697,309
3,697,329
3,697,332
3,697,379
3,697,381
3,697,385
3,697,389
3,697,393
3,697,415
3,697,438
3,697,439
3,697,442
3,697,454
3,697,470
3,697,529
3,697,544
3,697,554
3,697,593
3,697,599
3,697,603
3,697,612
3,697,614
3,697,692
3,697,764
3,697,791
3,697,794
3,697,809
3,697,810
3,697,811
3,697,819
3,697,829
3,697,869

44 : 3,696,701
3,696,770
3,696,920
3,697,359
3,697,863
45 : 3,697,497
3,697,823
3,697,908
46 : 3,697,498
47 : 3,696,951
3,697,259
3,697,317
3,697,374
3,697,441
3,697,465
3,697,744
3,697,756
3,697,984
48 : 3,696,456
3,696,463
3,696,464
3,696,516
3,696,556
3,697,871
3,697,873
3,697,896
3,697,900
3,697,925
3,697,927
3,697,928
3,697,932
3,697,933
3,697,934

3,696,586
3,696,597
3,696,624
3,696,660
3,696,688
3,696,794
3,696,804
3,696,833
3,696,867
3,696,868
3,696,876
3,696,884
3,696,894
3,697,071
3,697,076
3,697,113
3,697,141
3,697,199
3,697,246
3,697,337
3,697,365
3,697,488
3,697,699
3,697,707
3,697,710
3,697,752
3,697,821
3,697,893
3,697,937
3,697,938

3,697,939
3,697,952
3,697,999
3,698,003
3,698,012
49 : 3,696,517
3,696,523
3,696,536
3,696,705
3,696,979
3,696,999
3,697,112
3,697,412
3,697,711
50 : 3,696,704
51 : 3,696,447
3,696,761
3,696,790
3,696,817
3,696,821
3,696,849
3,697,065
3,697,120
3,697,249
3,697,250
3,697,694
3,697,740
3,697,844
3,697,870
3,697,957
3,697,958
3,697,986
3,697,987

53 : 3,696,625
3,696,674
3,696,911
3,697,080
3,697,145
3,697,293
3,697,436
3,697,981
54 : 3,696,519
3,696,963
3,697,579
3,697,625
3,697,627
55 : 3,696,445
3,696,607
3,696,828
3,696,830
3,696,861
3,696,881
3,696,887
3,696,950
3,696,977
3,697,010
3,697,048
3,697,073
3,697,148
3,697,325
3,697,328
3,697,348
3,697,367
3,697,417
3,697,559
3,697,773
3,697,781
3,697,846
3,697,973
3,697,989
56 : 3,696,866

U.S. GOVERNMENT PRINTING OFFICE: 0—1972

U. S. DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

PATENT OFFICE
Robert Gottschalk, Commissioner